START

ROLL NO. 2

PLAN RECORD BY MHI

ALT. NO.	MARK	DESCRIPTION	DATE	BY
ORIG.		FOLLOWED MES ORIGINAL PLAN	MAY. 8 '85	
-10	Ⓐ	SUBMITTED FOR APPROVAL OF OWNER & ABS PREPARED TO MODIFICATION FOR MHI BUILDING SHIPS. 1. REARRANGED BLOCK BUTT JOINTS ON CENTER LINE LONGITUDINAL BOX GIRDER. 2. DELETED BLOCK BUTT JOINTS ON CENTER LINE LONGITUDINAL BOX GIRDER. 3. SHIFTED BLOCK BUTT JOINTS ON HORIZONTAL GIRDER & TRANS WEB OF CONTAINER SUPPORT CONSTRUCTION IN WAY OF LONGL BULKHEAD. 4. ADDED BLOCK BUTT JOINTS ON TRANS BOX GIRDER OF CONTAINER SUPPORT CONSTRUCTION IN WAY OF C.L. LONGITUDINAL BOX GIRDER. 5. DELETED BUTT JOINTS ON CELL GUIDES. 6. ADDED BUTT JOINTS ON CELL GUIDES. 7. ADDED DETAIL PLANS IN RELATION TO ITEM 3. BASED DWG. MES DWG NO. 2107312 (INCL. PARTLY REVISED PLAN NO. 1)	JUL. 10. '85	To.H. H.Ko
-11		FOLLOWED MES PARTLY REVISED PLAN NO. 2	JUL. 22. '85	H.Ko
		DO. NO. 3		
-12	Ⓑ	1. ADDED BLOCK BUTT JOINTS ON C.L. SEC. (P. SIDE). 2. PENETRATED C.L. VERT. WEB (P. SIDE) AT HORIL GIRDER IN SEC. Ⓐ & PASSAGE DECK PLAN. 3. ADDED DRAIN HOLES ON BOX GIRDER BOTTOM. 4. ADDED INSERT PLATES IN SEC. FR. 214. 5. DELETED ADJUSTING PIECE OF LOWER END OF CELL GUIDE. 6. MODIFIED SHAPE OF CELL GUIDE RIBS.	AUG. 20. '85	To.H. H.Ko
-13	Ⓒ	DELETED BLOCK BUTT JOINT ON C.L. SEC. (P. SIDE).	OCT. 31. '85	H.Ko

A4 36 / A3 19 / SUM 55 — 55 SHEETS WITH COVER

CON-FERRED	SHIP DESIGNING DEPARTMENT HULL DESIGNING SECTION	
	APPROVED To. Hirayama / H. Kokawa	CLASS ABS
	CHECKED S. Furuhashi	コンテナー支持構造 (オ2倉) CONTAINER SUPPORT CONST. (NO. 2 H.)
	DRAWN	
	SCALE	
	ORDER 01-15800 ~~01-15900~~ ~~01-16400~~	DRAWING NO. HS-19420 - F / LYKES REF. NO. 120504

MITSUBISHI HEAVY INDUSTRIES, LTD.
KOBE SHIPYARD & ENGINE WORKS

0-1

PLAN RECORD BY MHI (CONTINUE)

ALT. NO.	MARK	DISCRIPTION	DATE	BY
—	—	DELETED MHI PARTLY REVISED PLAN NO. -13 REFER TO MHI TLX NO. LL-126 DATED NOV. 25 '85.	NOV. 25 '85	To.H.
-F	—	PREPARED AS FINISHED PLAN FOR S. NO. 1158	MAR. 11. '87	H.Ko

0-2

APPROVAL OF OWNER & REGULATORY BODIES

ALT. NO.	OWNER DATE	OWNER LETTER NO.	USCG DATE	USCG LETTER NO.	ABS DATE	ABS LETTER NO.	USPH DATE	USPH LETTER NO.
ORIGINAL	26 MAY '85	OFTS/MES-448						

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SHIPYARD AND SHIP'S NO. & NAME

~~MITSUI TAMANO~~		MITSUBISHI KOBE	
NO. 1323	~~DOCTOR LYKES~~	NO. 1158	JAMES LYKES
NO. 1324	~~ALMERIA LYKES~~	NO. 1159	~~JOSEPH LYKES~~
NO. 1325	~~TILLIE LYKES~~	NO. 1164	~~SOLON TURMAN~~

MITSUI ENGINEERING & SHIPBUILDING CO., LTD.
TAMANO WORKS

SHIP DESIGN DEPARTMENT MANAGER — SHIP'S NO. — SHIP'S NAME

STRUCTURE DESIGN SEC.
SEC. CHIEF N. Yamamoto
ASSIST. CHIEF
CHARGE ENG'R H. Hikiyamoto
STAFF T.G H.Y.

PARTLY REVISED PLAN NO. 3

コンテナー支持構造 (オ2倉)
CONTAINER SUPPORT CONST. (NO. 2 H.)

DATE 60.2.11 (TEL. 1130)
JOB NO. TS1323/24/25
JOBCLASSIF. NO. 8.07
SCALE 1/100
LYKES REF. NO. 120504
MITSUI DRAWING NO. 2107312-3

(3 SHEETS WITH COVER)

0-3

PLAN RECORD

ALT. NO.	MARK	ALTERATION/DESCRIPTION	DATE & SIGNATURE
ORIGINAL		PREPARD FOR APPROVAL OF OWR & ABS	APR. 18 '85
1	1	MISCELLANEOUS RIVISION (DESIGN DEVELOPMENT)	JUN. 20 '85 J.M.
	1	DESIGN DEVELOPMENT & OWNERS COMMENT	
2	2	MISCELLANEOUS RIVISION (DESIGN DEVELOPMENT)	JUL. 9 '85 H.Y.
3	3	MISCELLANEOUS RIVISION	JUL. 29 '85 H.Y.

DWG. NO. 2107312-1

575

NOTES:-

1. BOTH SIDES TO BE SYMMETRICAL EXCEPT SPECIFIED.
2. TRANS. SECTIONS TO BE "LOOKING FORE" EXCEPT SPECIFIED.
3. REFER TO "CONSTRUCTION DETAILS (DWG NO. 2100811)" FOR STRUCTURAL DETAILS OF MEMBERS, ETC. EXCEPT SPECIFIED.
4. REFER TO "WELDING TABLE (DWG NO. 2100832)" FOR LEG LENGTH OF WELDING EXCEPT SPECIFIED.

MATERIAL LIST

	ITEM	MTERIAL	NO	WT (TON) ABT.
①	ENTRY GUIDE	(STEEL CASTING) SC42 (MAX. CARBON 0.20%)	16	
②	〃	〃	8	
③	〃	〃	24	
◯				
◯				

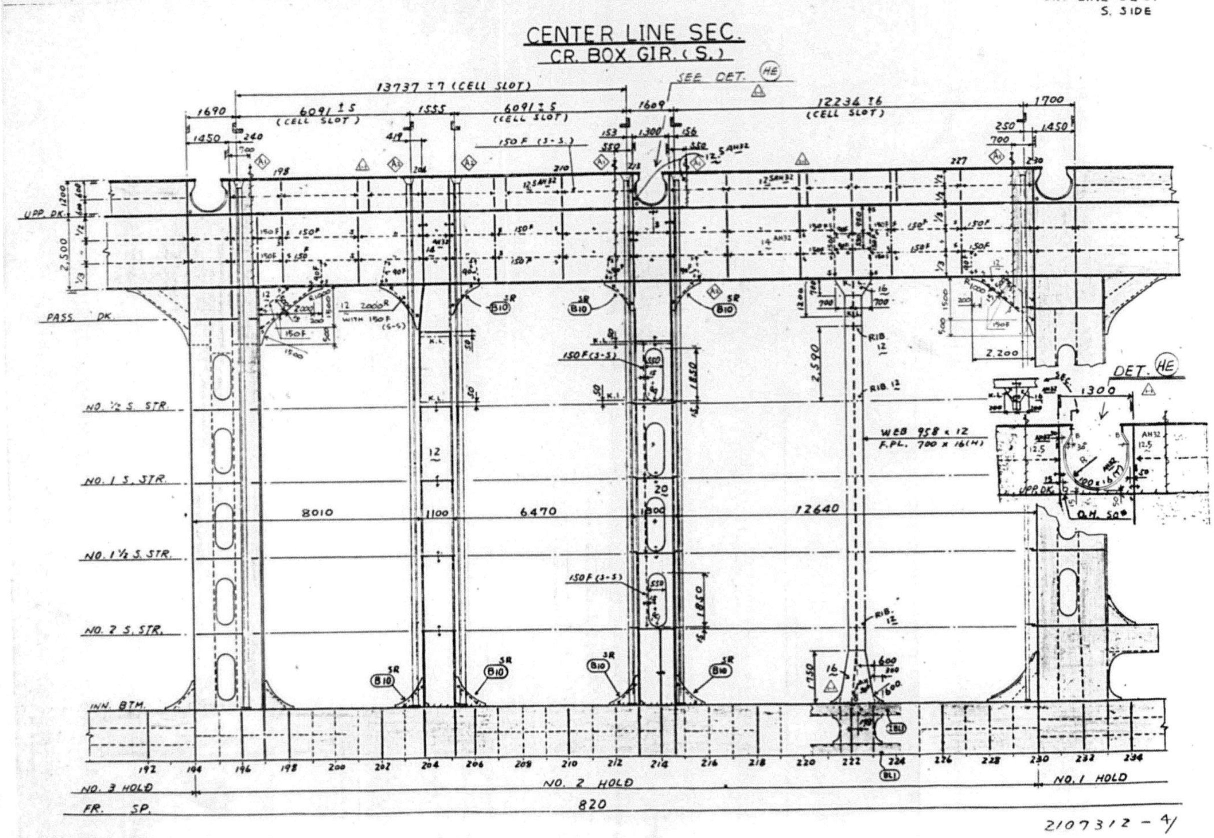
備考:-

1. 特記の他は，両舷対称とする。
2. 横断面図は，特記の他は後面を示す。
3. 構造詳細については，特記の他は
 "構造詳細図（図番 2100811）"を参照のこと。
4. 溶接脚長については，特記の他は
 "溶接脚長表（図番 2100832）"を参照のこと。

2107312 - 2/

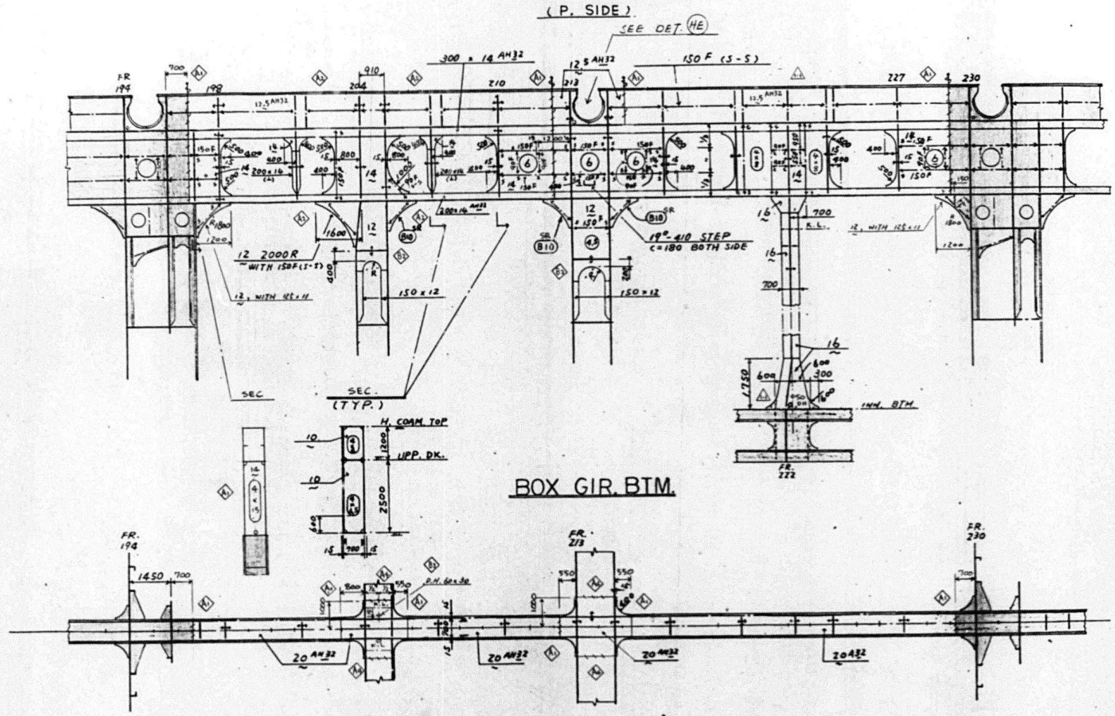
2107312 - 3/

CR. LINE SEC.
S. SIDE



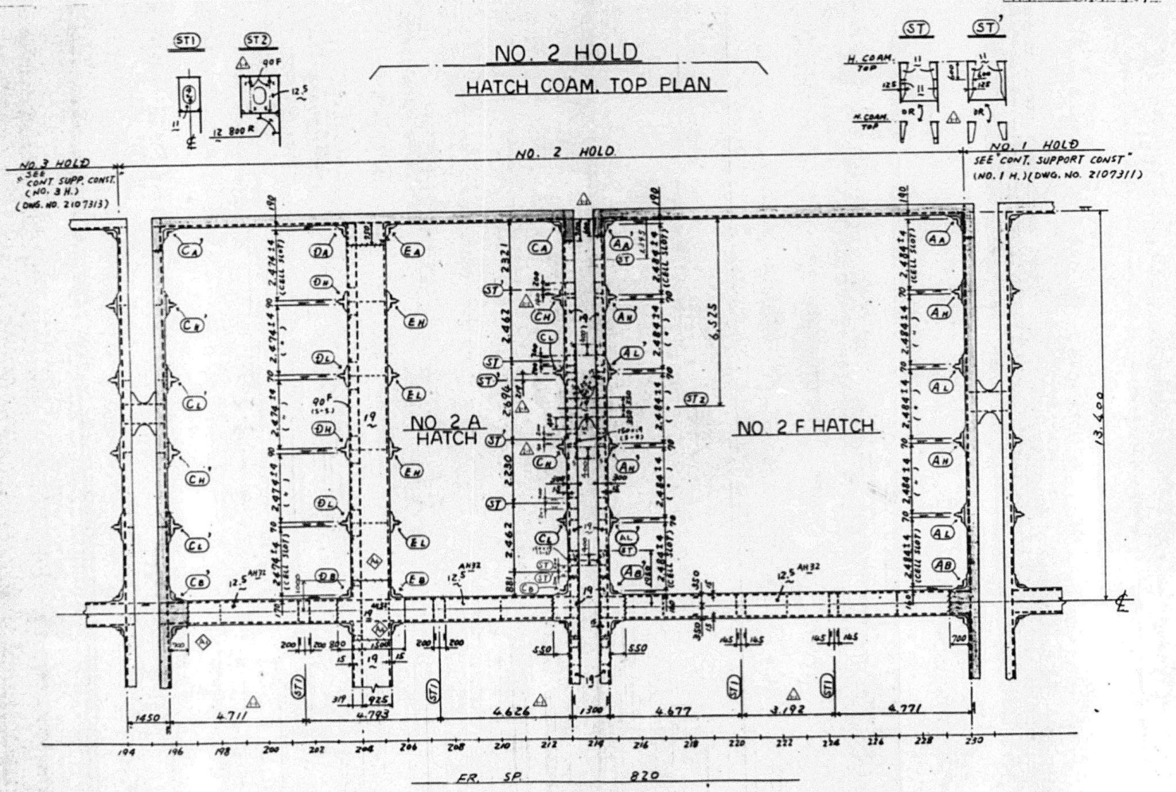
2107312 - 4/

CR. LINE SEC.
P. SIDE



2107312 - 5/

HATCH COAM. TOP



2107312 - 6/

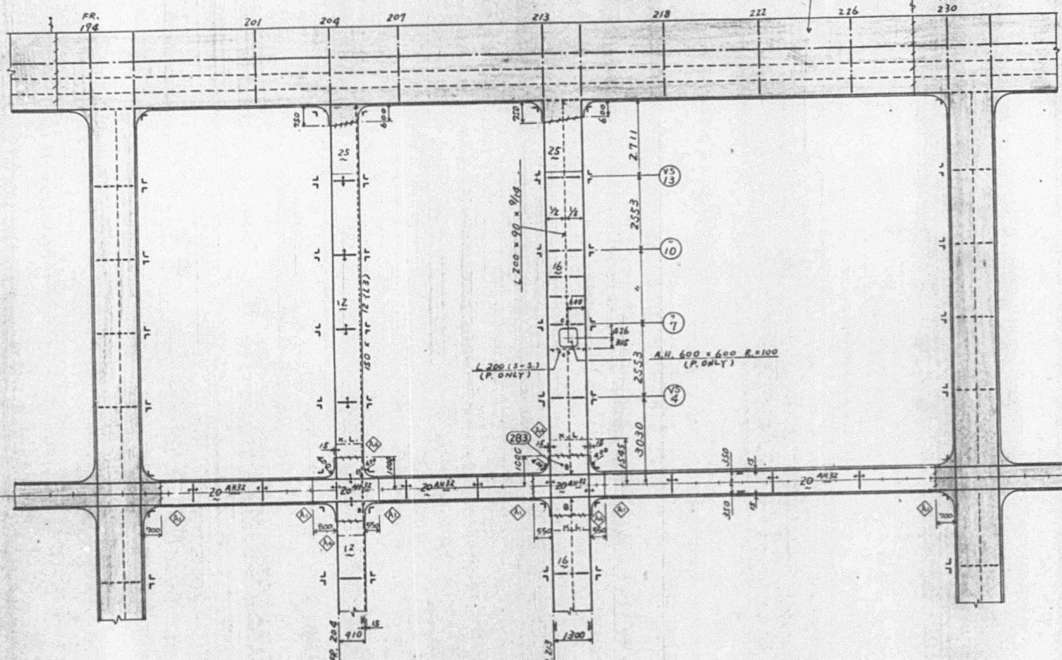
577

| UPP. DK. PLAN

UPPER DECK

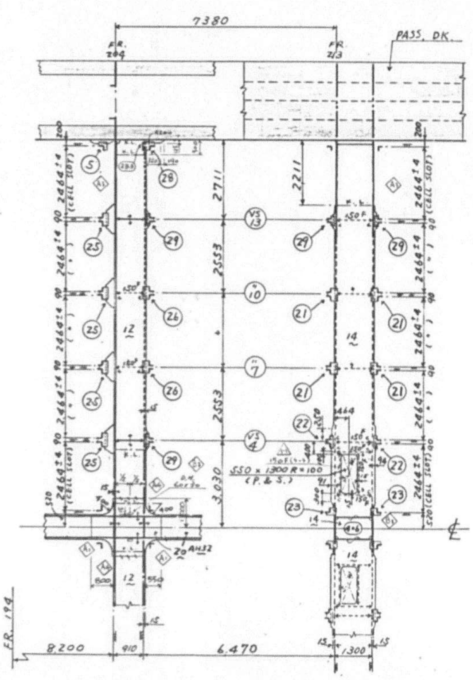
CARGO HOLD CONST. (NO. 2 H.) SEE (DWG. NO. 2101012)

CARGO HOLD CONST. (NO. 1 H.) SEE (DWG. NO. 2101011)



2107312 - 7/

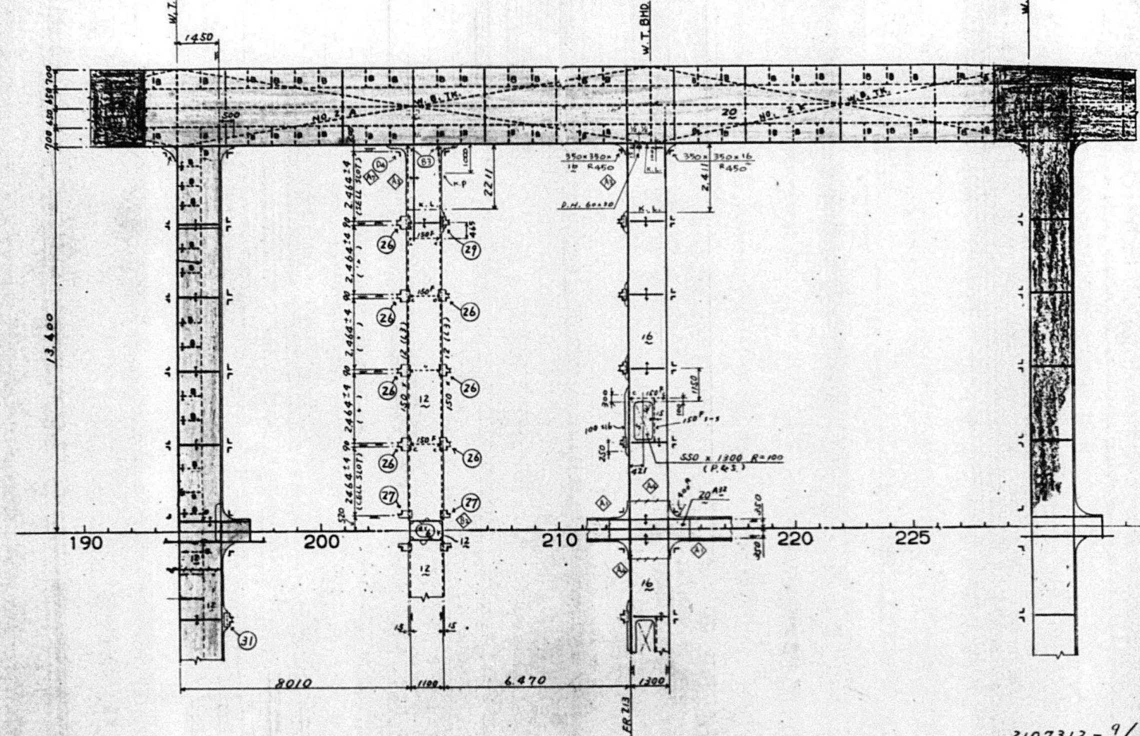
SEC. "A"



2107312 - 8/

PASS. DK. PLAN

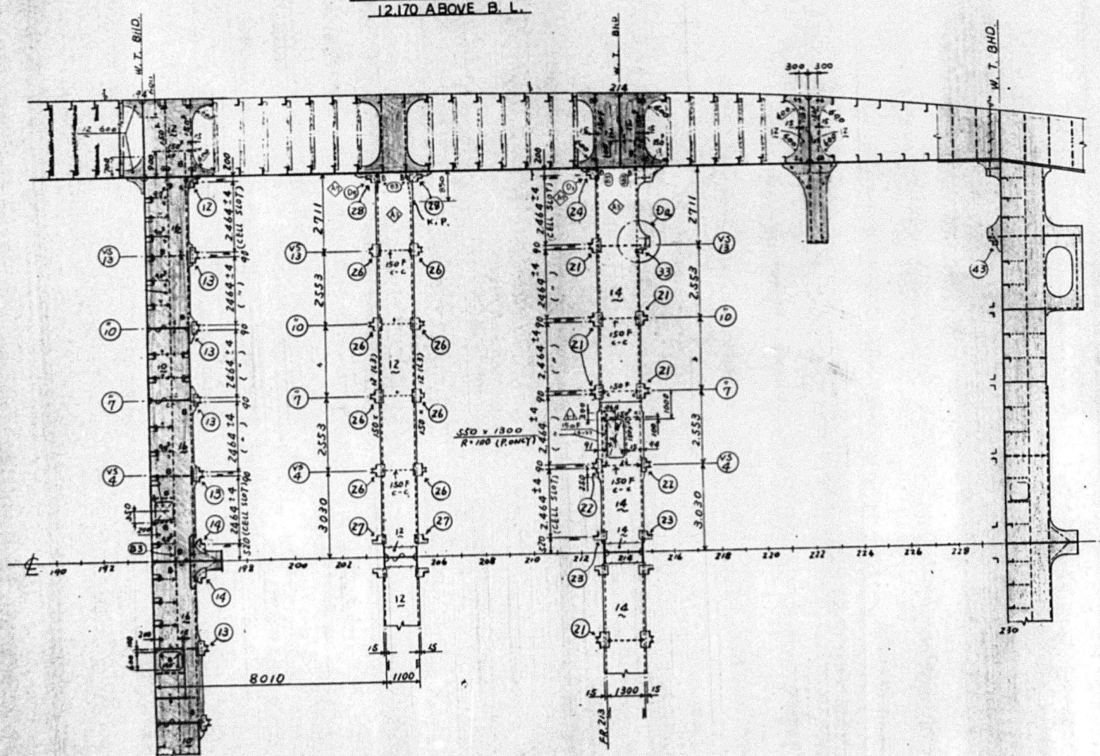
PASSAGE DECK PLAN
15,300 ABOVE B. L.



2107312 - 9/

NO. 1/2 SIDE STR.

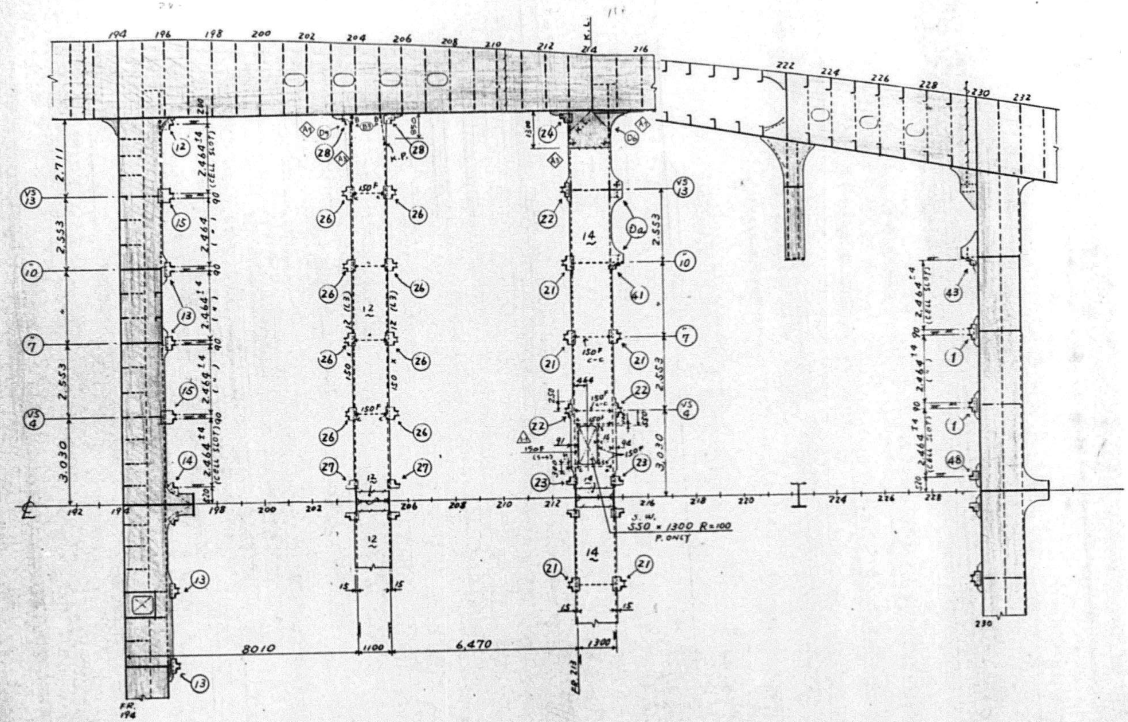
NO. 1/2 S. STR.
12,170 ABOVE B. L.



2107312 - 10/

NO. 1 SIDE STR.

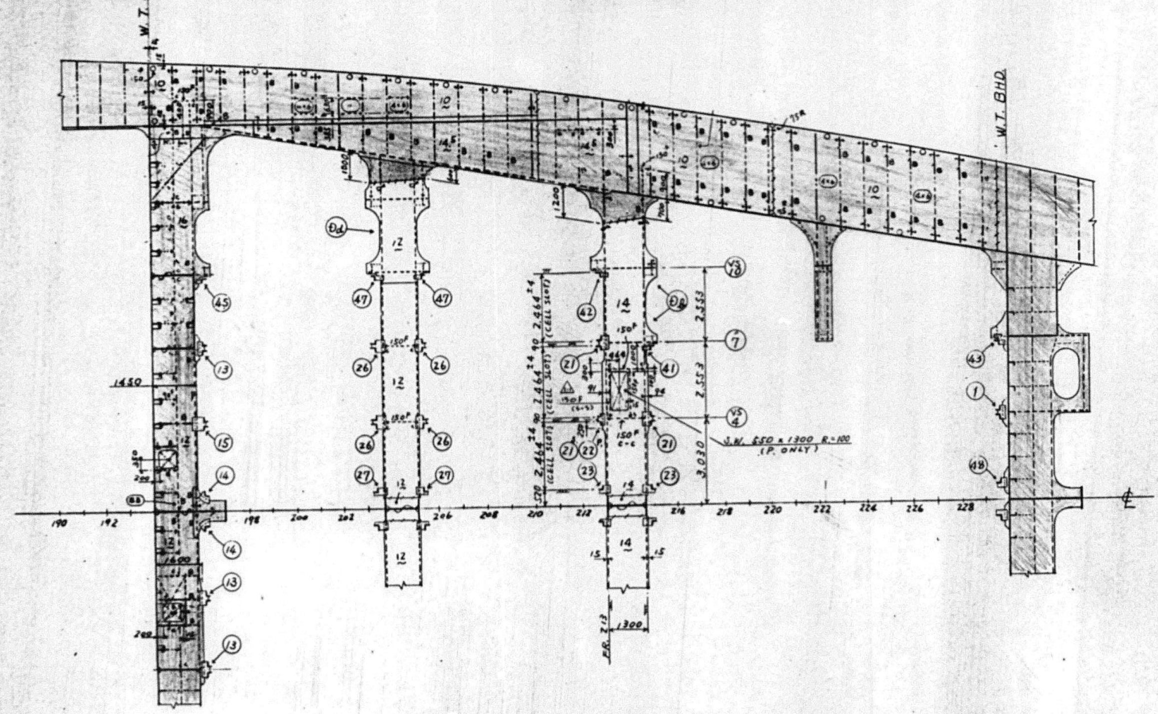
NO. 1 SIDE STR.



2107312 - 11/

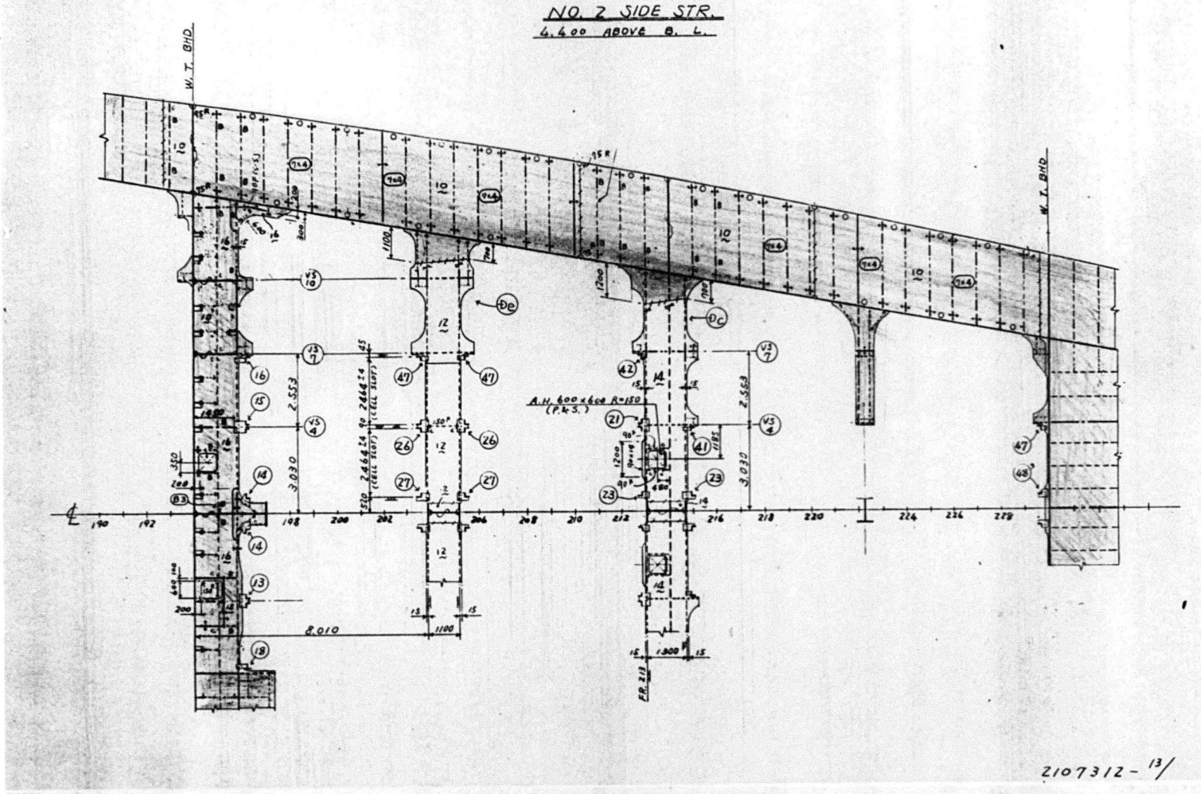
NO. 1½ SIDE STR.

NO. 1½ SIDE STR.

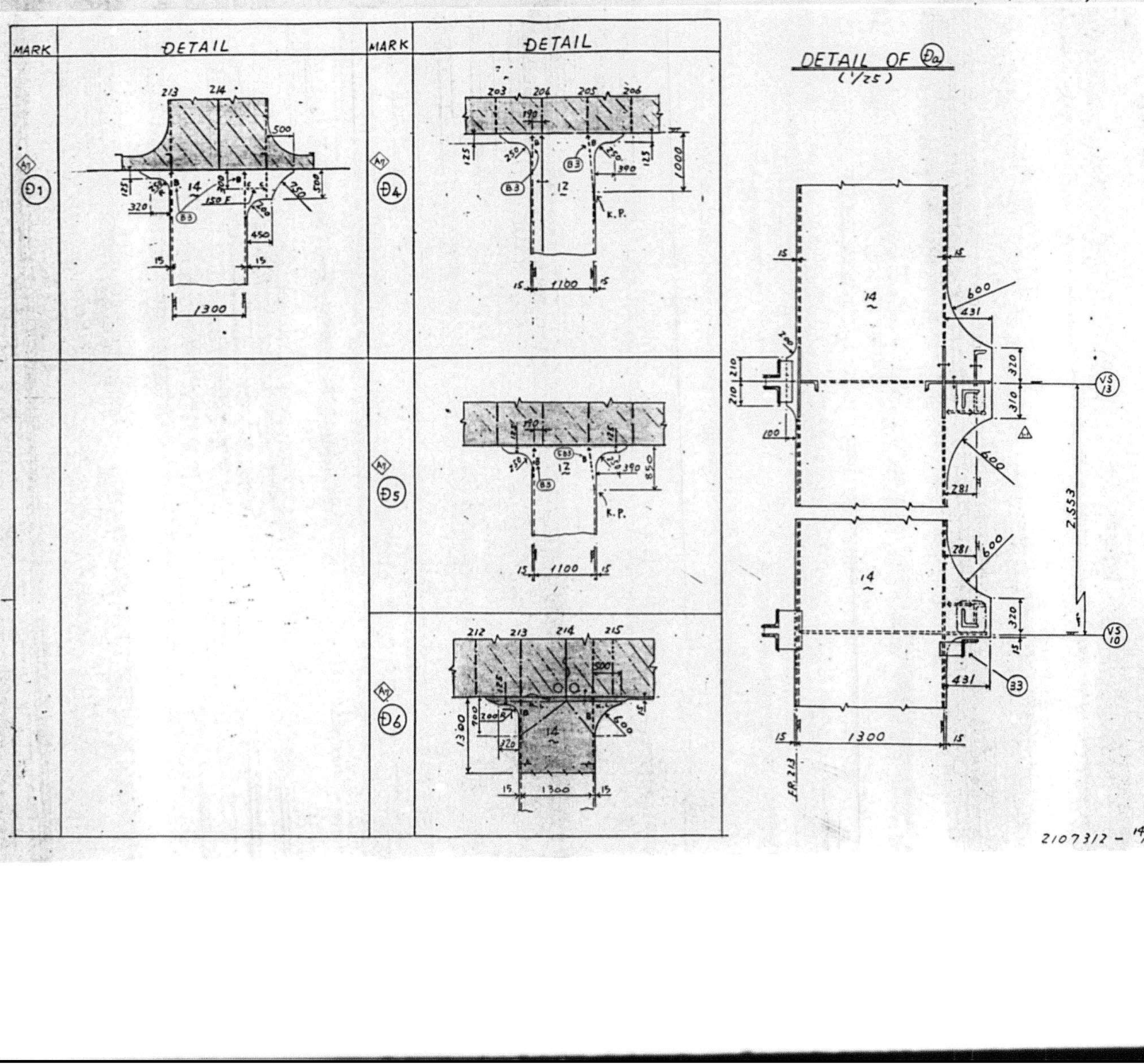


2107312 - 12/

NO. 2 SIDE STR.

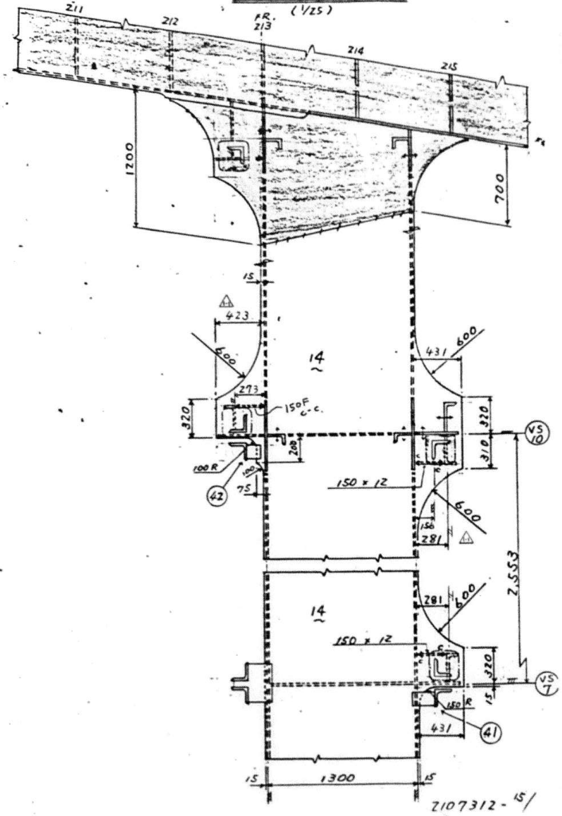


2107312 - 13/



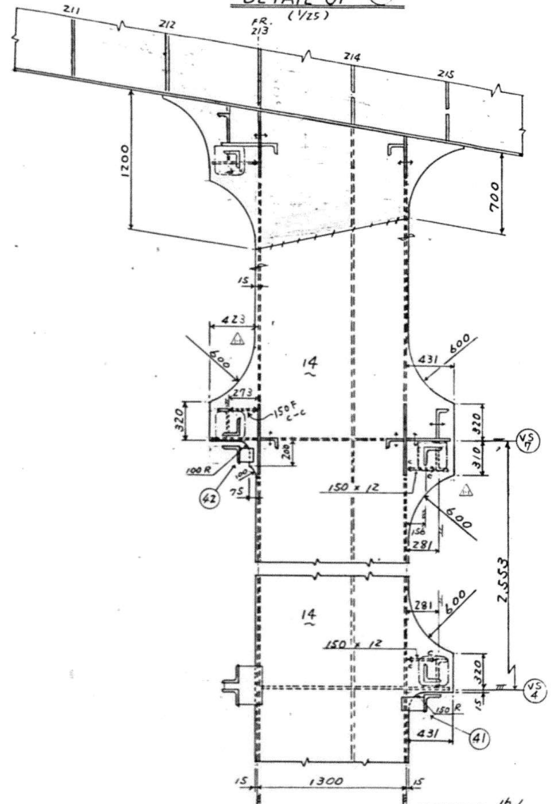
2107312 - 14/

DETAIL OF Ⓓb (1/25)



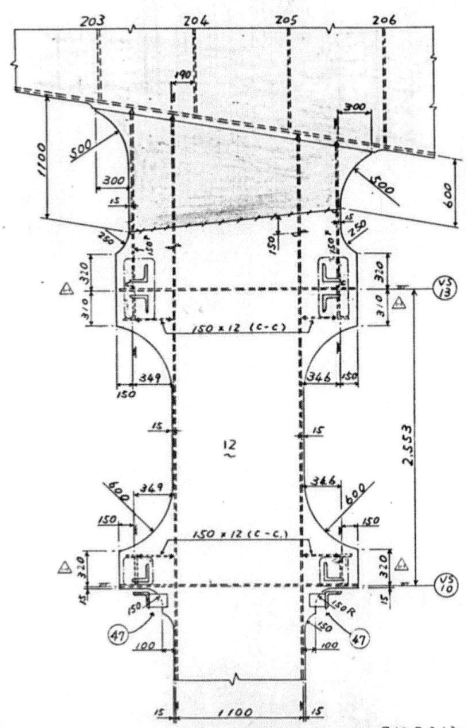
2107312-15/

DETAIL OF Ⓓc (1/25)



2107312-16/

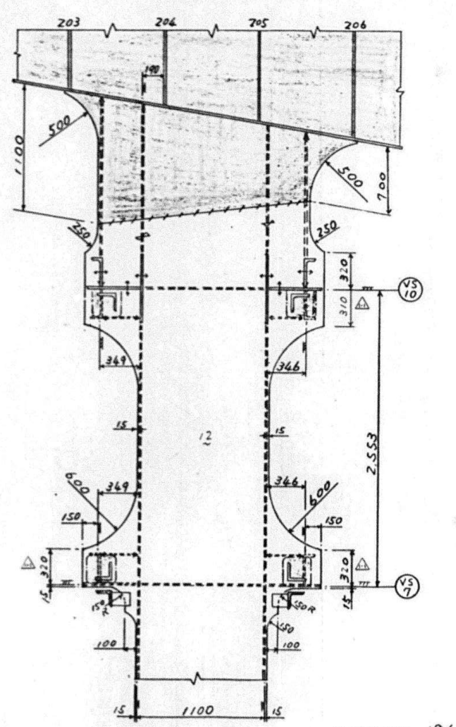
DETAIL OF Ⓓd (1/25)



2107312-17/

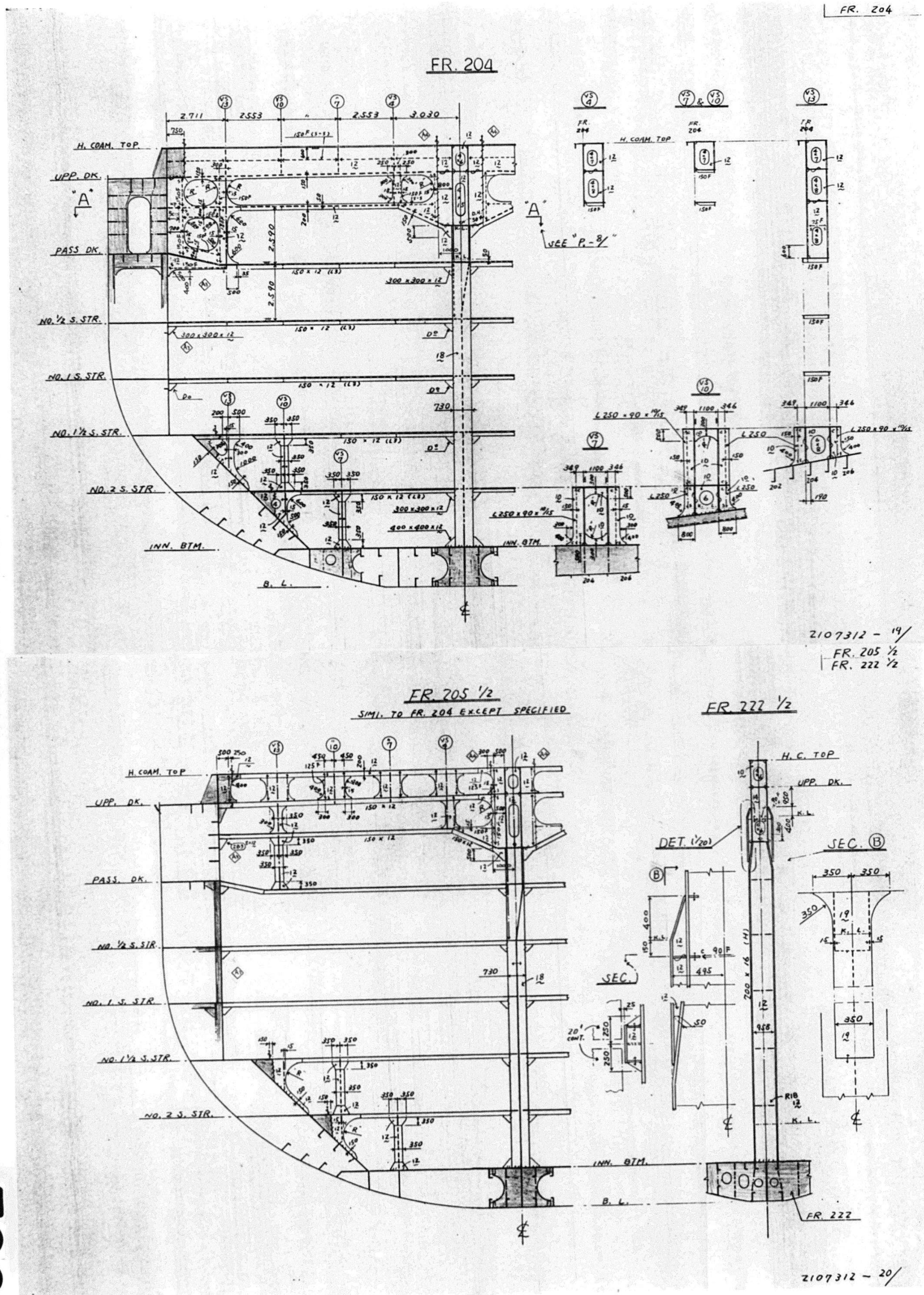
DETAIL OF Ⓓe

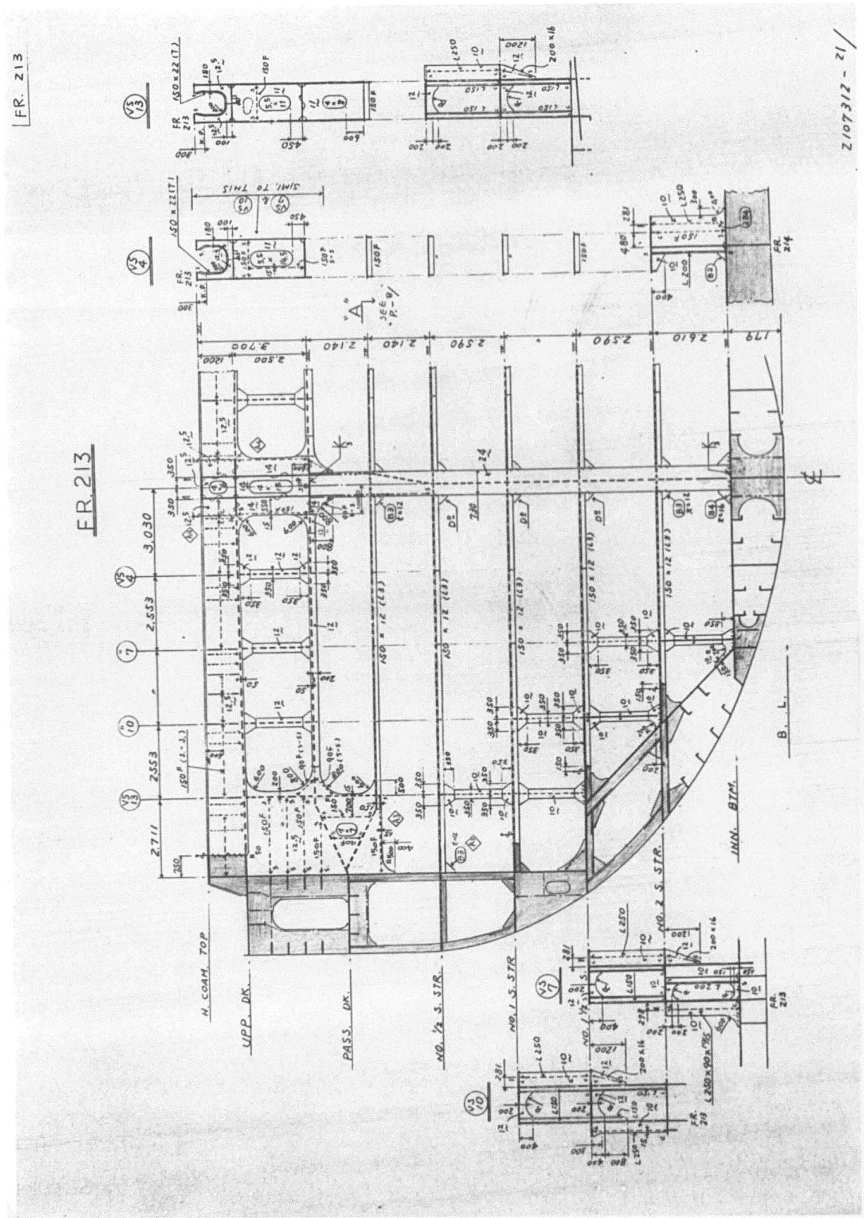
SIMILAR TO DETAIL Ⓓd EXCEPT SPECIFIED

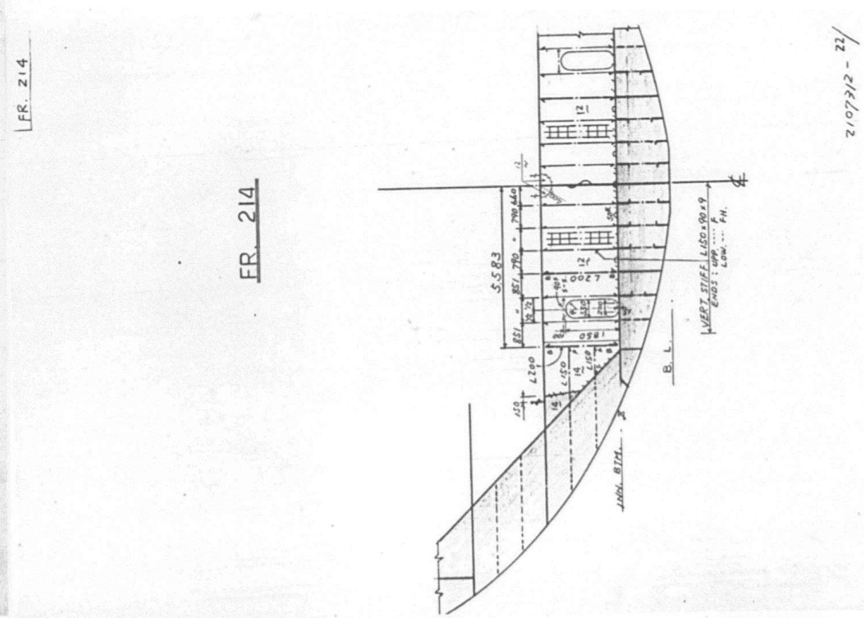


2107312-18/

582

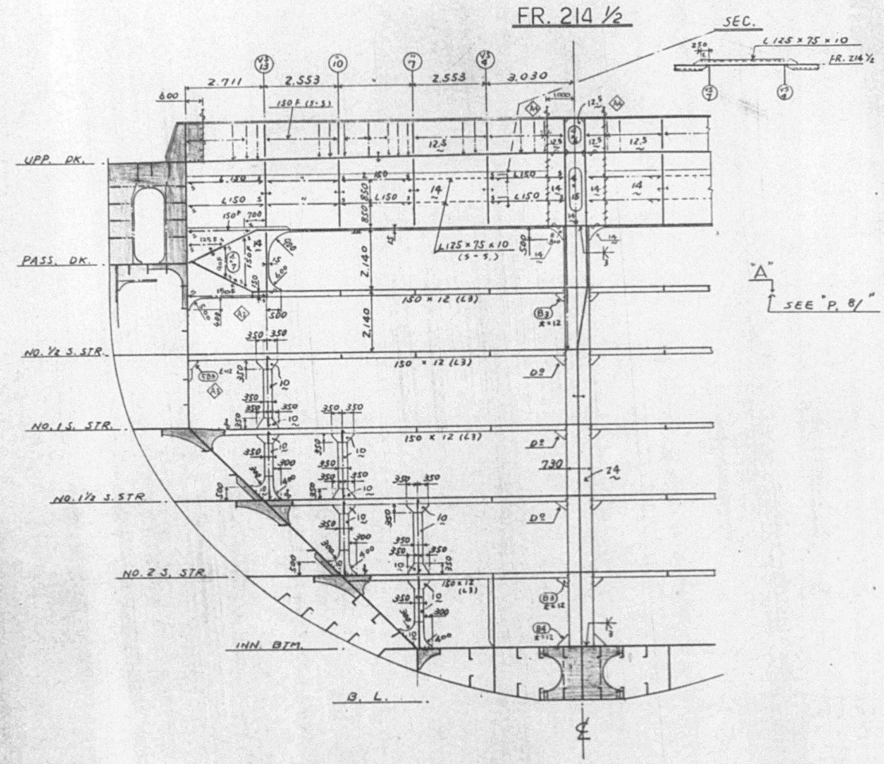

FR. 204
FR. 204
H. COAM. TOP
UPP. DK.
PASS. DK.
NO. ½ S. STR.
NO. 1 S. STR.
NO. 1½ S. STR.
NO. 2 S. STR.
INN. BTM.
B. L.
SEE "P.-8"
2107312 - 19/
FR. 205 ½
FR. 222 ½
FR. 205 ½
SIMI. TO FR. 204 EXCEPT SPECIFIED
FR. 222 ½
H. C. TOP
DET. (1/20)
SEC. B
SEC.
FR. 222
2107312 - 20/


FR. 213
FR. 213
UPP. DK.
PASS. DK.
H. COAM. TOP
NO. 1/2 S. STR.
NO. 1 S. STR.
NO. 2 S. STR.
INN. BTM.
B. L.
2107312 - 21/


FR. 214
FR. 214
B. L.
INN. BTM.
2107312 - 22/

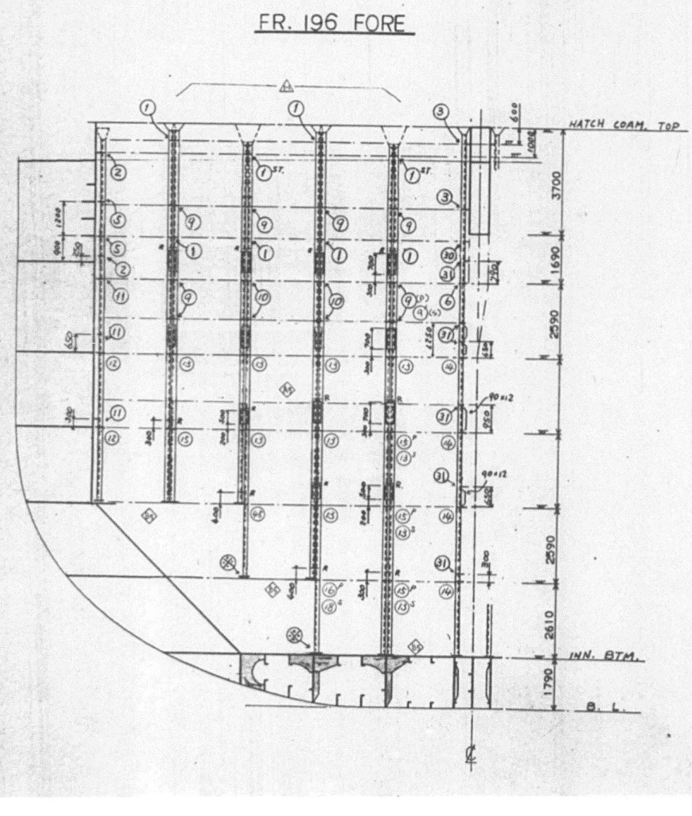
584

FR. 214 ½



210731Z - 23/

FR. 196 FORE



210731Z - 24/

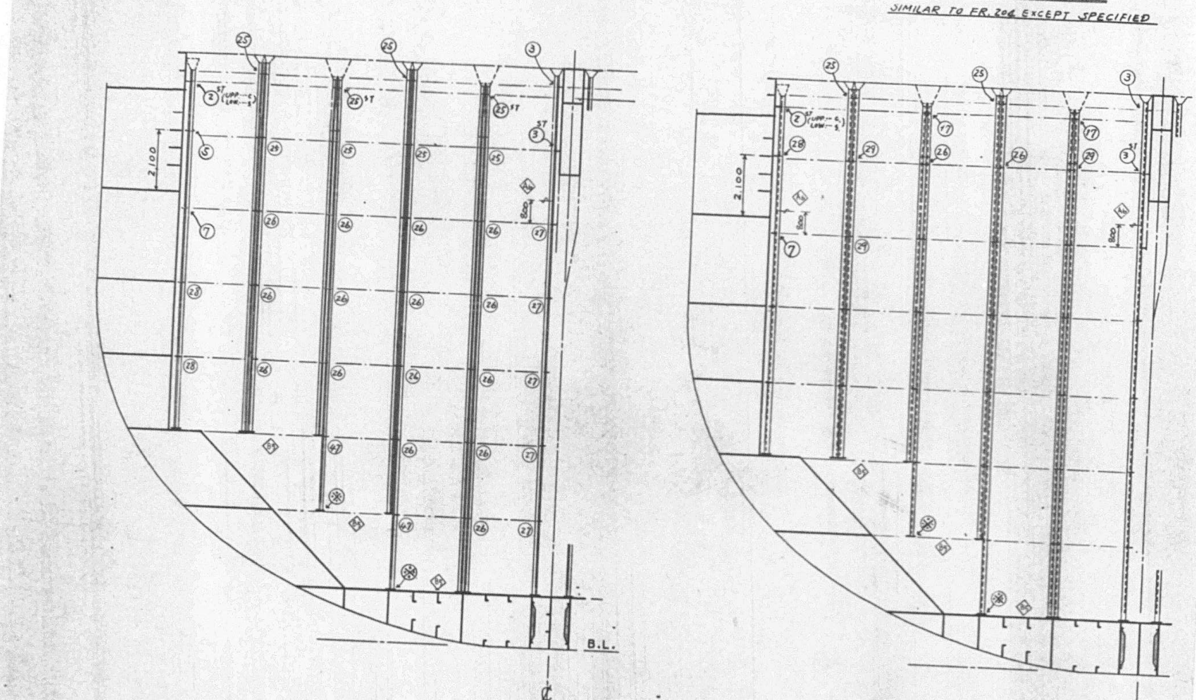
585

FR. 204 AFT
FR. 205 FORE

FR. 204 AFT

FR. 205 FORE

SIMILAR TO FR. 204 EXCEPT SPECIFIED



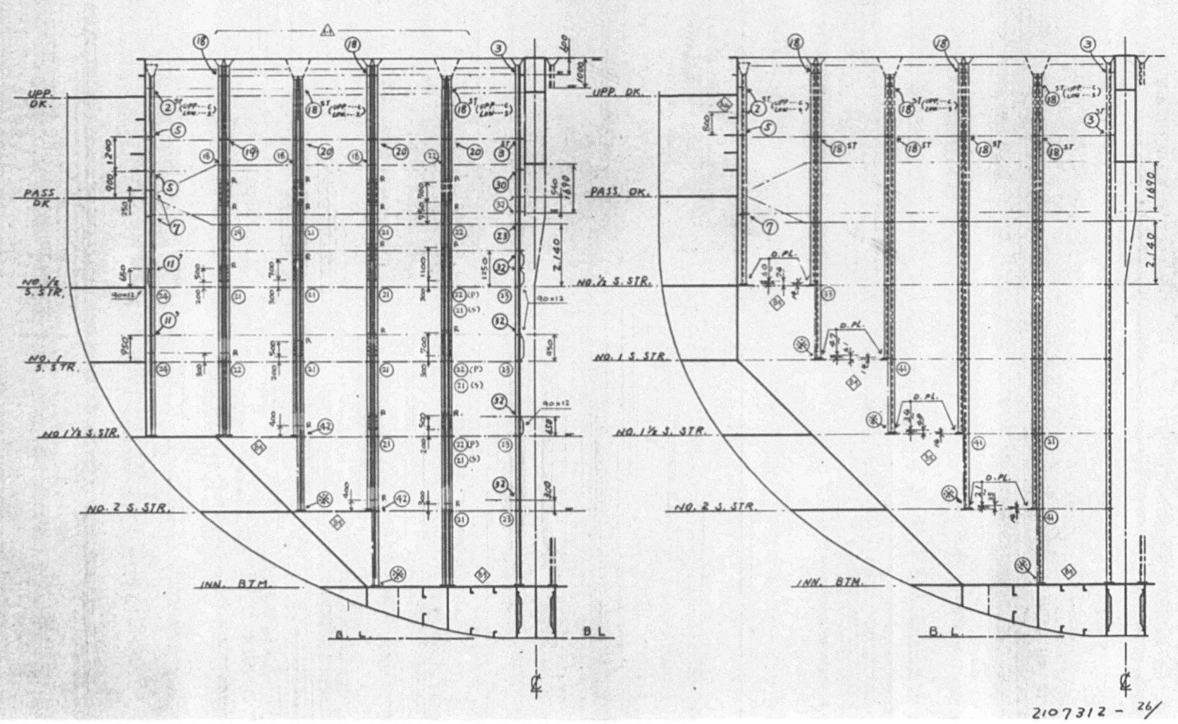
2107312 - 25/

FR. 213 AFT
FR. 214 FORE

FR. 213 AFT

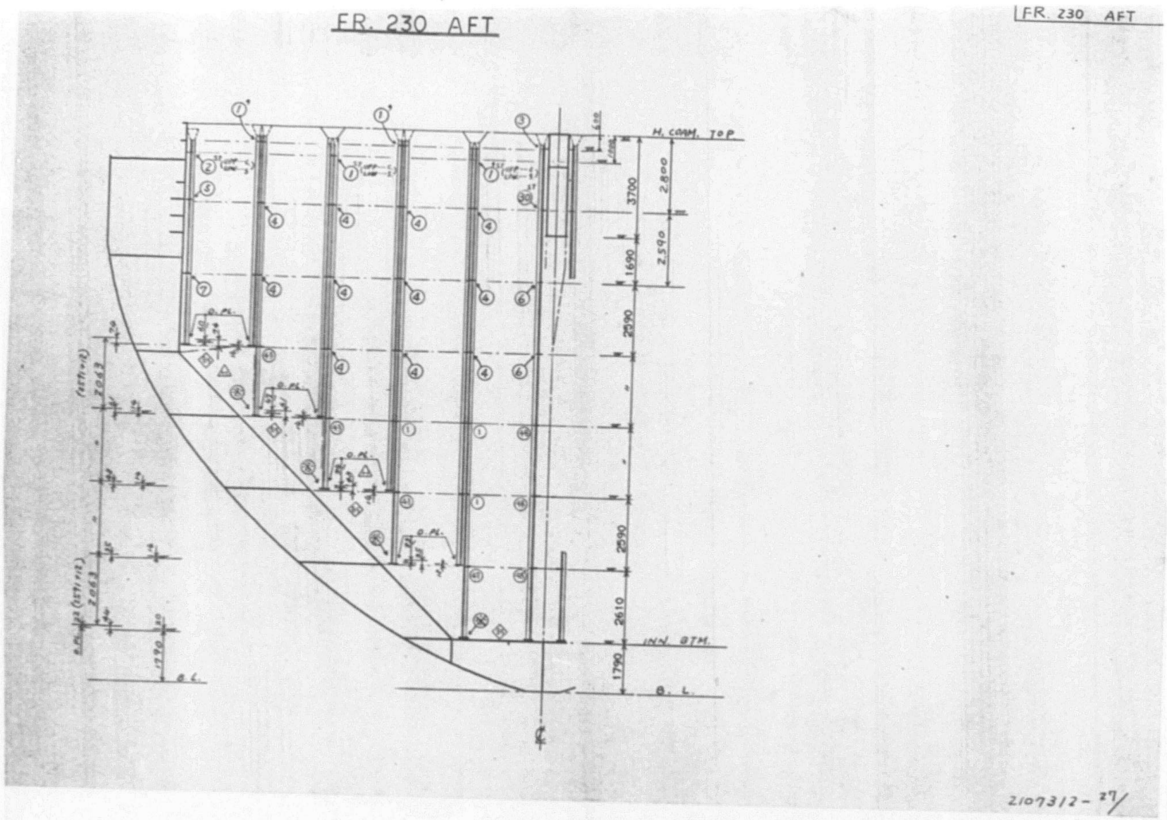
FR. 214 FORE

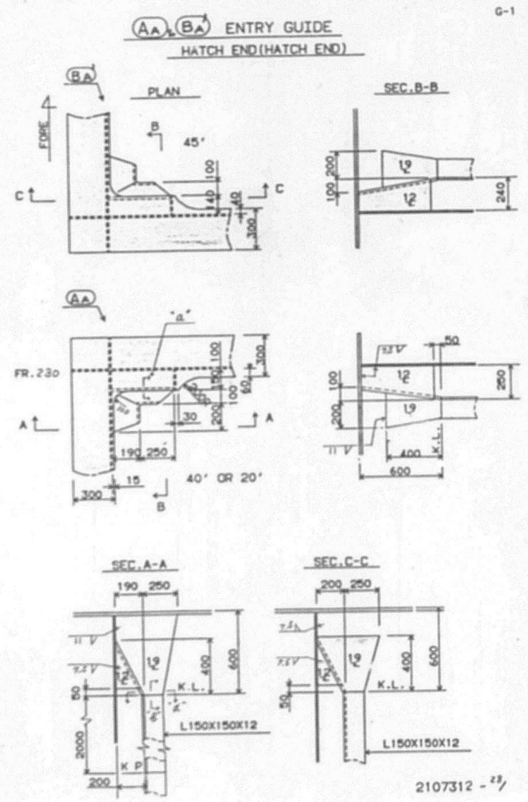
SIMILAR TO FR. 213 EXCEPT SPECIFIED

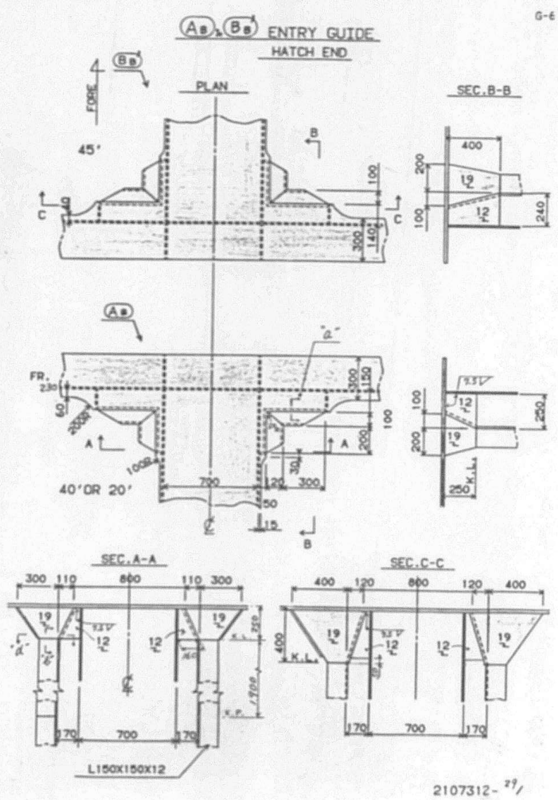


2107312 - 26/

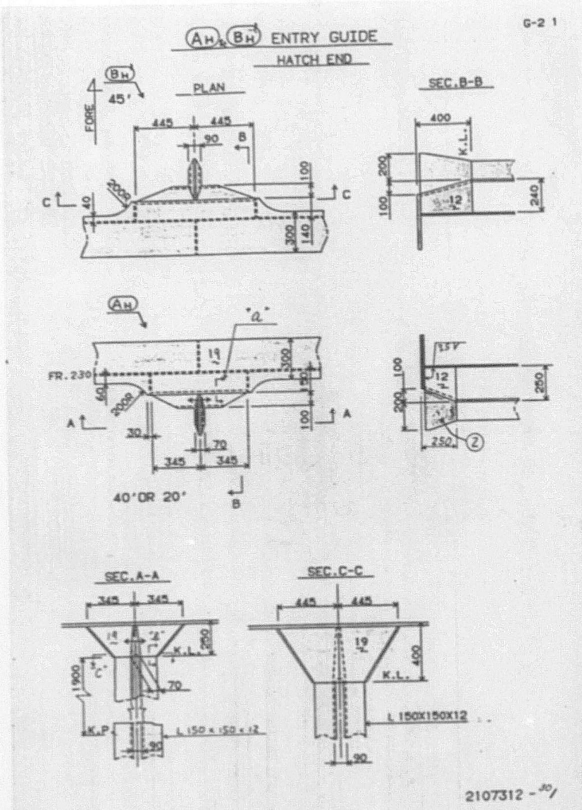
FR. 230 AFT

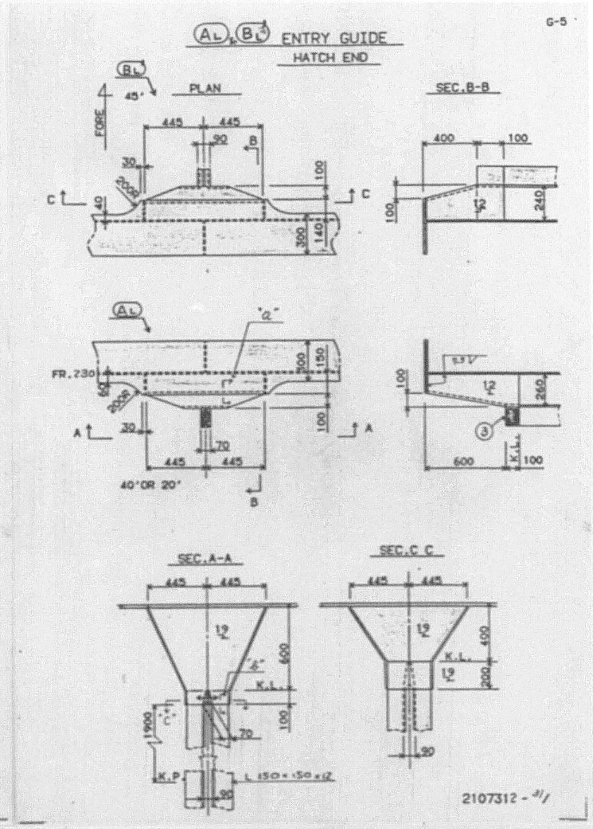


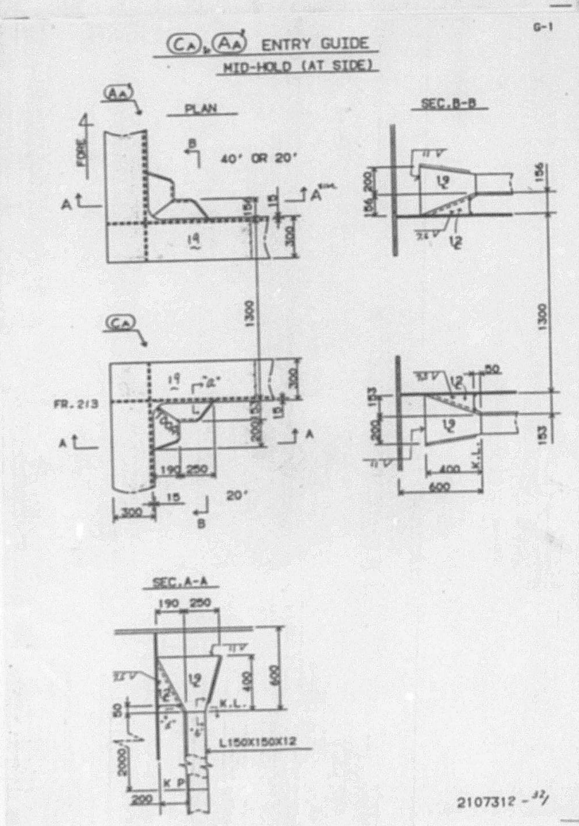


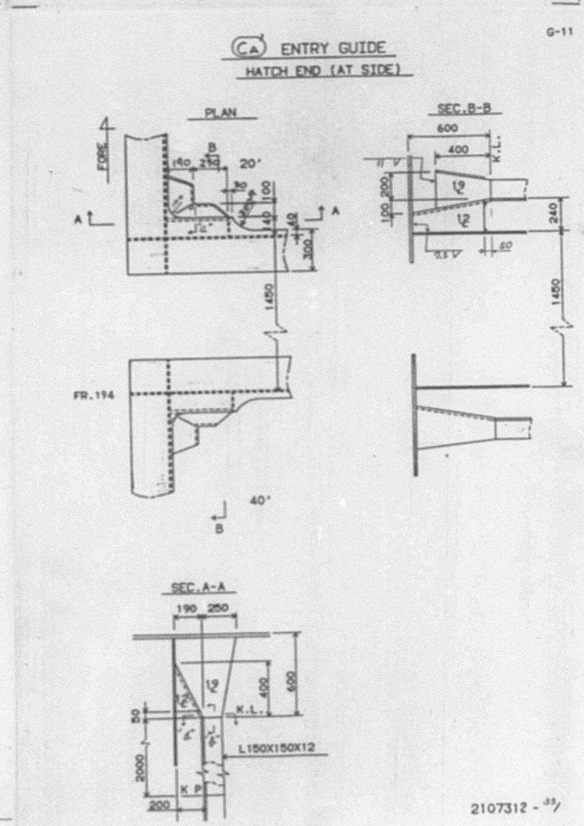


587


G-2 1
AH, BH ENTRY GUIDE
HATCH END
PLAN
SEC.B-B
FORE
45'
40'OR 20'
FR.230
SEC.A-A
SEC.C-C
K.L.
K.P
L 150X150X12
L 150×150×12
2107312 - 30/


G-5
AL, BL ENTRY GUIDE
HATCH END
PLAN
SEC.B-B
FORE
45'
40'OR 20'
FR.230
SEC.A-A
SEC.C C
K.L.
K.P
L 150×150×12
2107312 - 31/

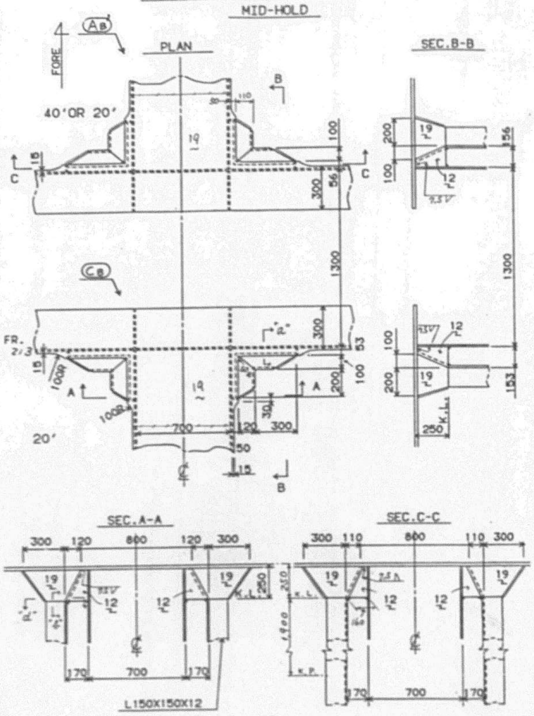

G-1
CA, AA ENTRY GUIDE
MID-HOLD (AT SIDE)
PLAN
SEC.B-B
FORE
40' OR 20'
20'
FR.213
SEC.A-A
K.L.
K P
L150X150X12
2107312 - 32/


G-11
CA ENTRY GUIDE
HATCH END (AT SIDE)
PLAN
SEC.B-B
FORE
20'
40'
FR.194
SEC.A-A
K.L.
K P
L150X150X12
2107312 - 33/

588

G-6

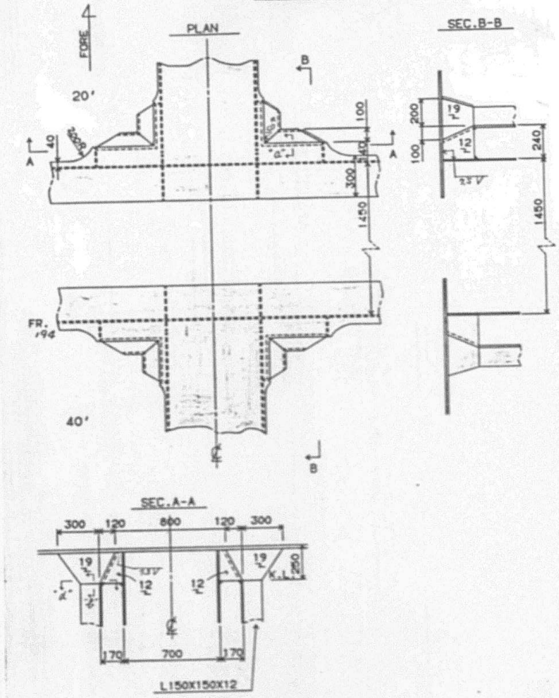
(CB), (AB') ENTRY GUIDE
MID-HOLD



2107312 - 34/

G-14

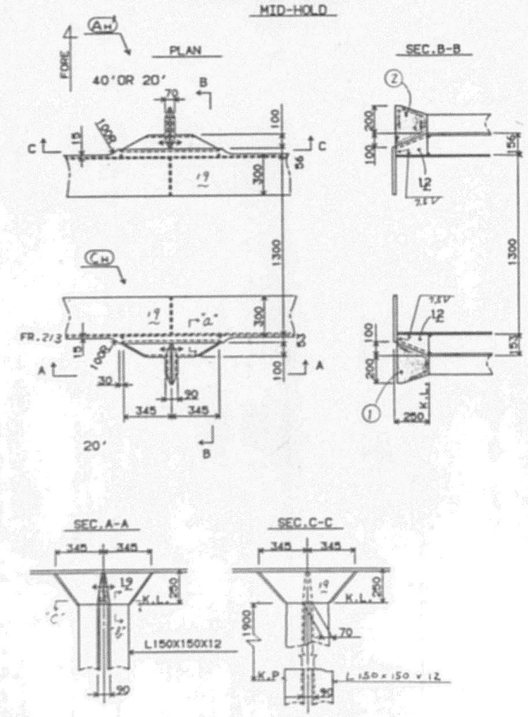
(CB') ENTRY GUIDE
HATCH END



2107312 - 35/

G-2

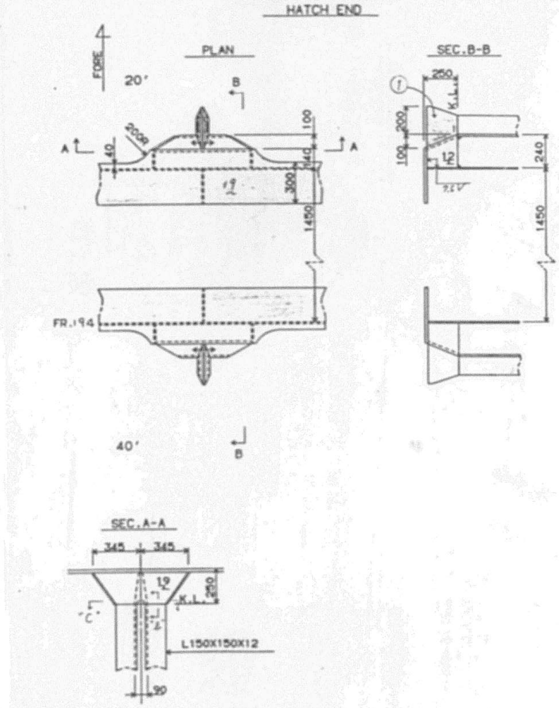
(CH), (AH') ENTRY GUIDE
MID-HOLD



2107312 - 36/

G-12

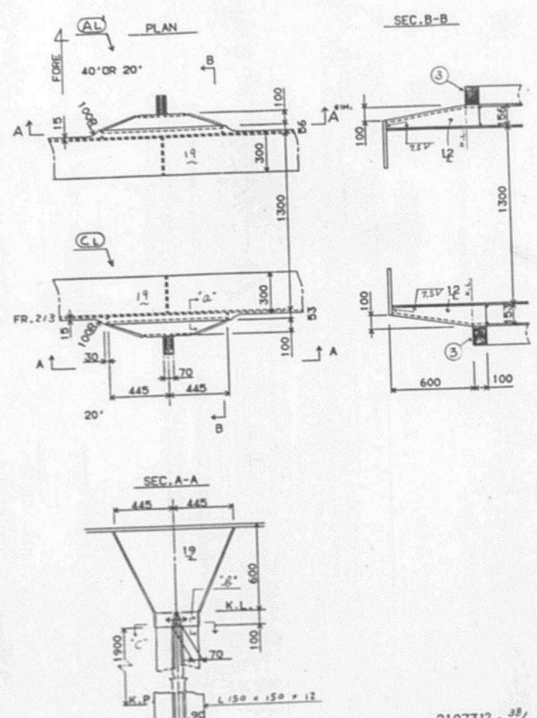
(CH') ENTRY GUIDE
HATCH END



2107312 - 37/

G-5

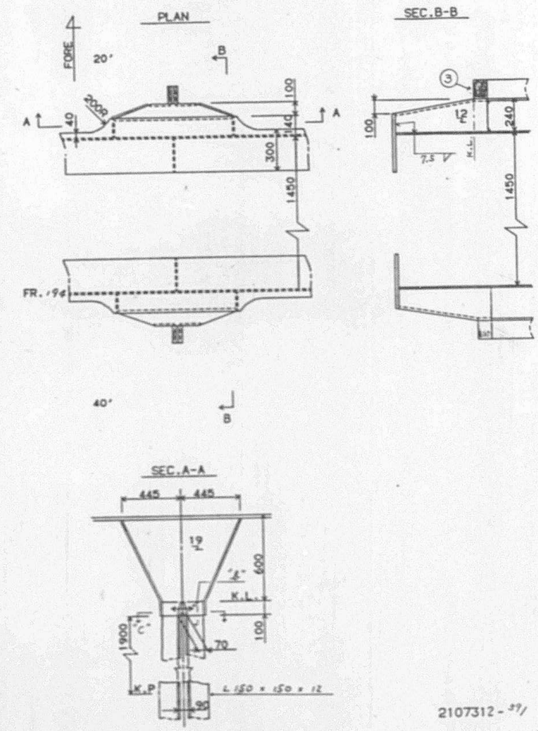
C_L, A_L ENTRY GUIDE
MID-HOLD



2107312 - 38/

G-13

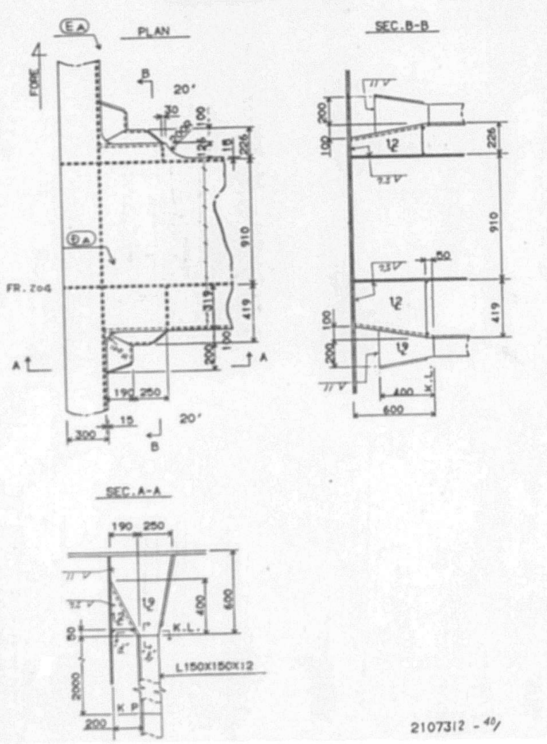
C_L ENTRY GUIDE
HATCH END



2107312 - 39/

G-15

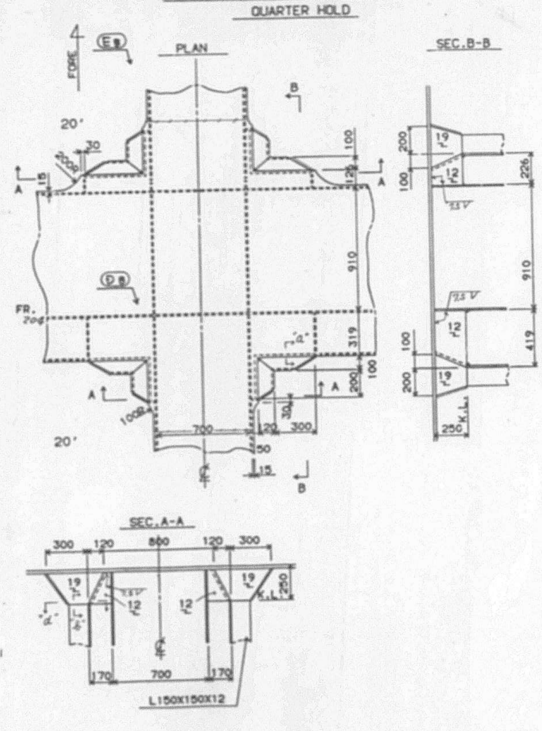
D_A, E_A ENTRY GUIDE
QUARTER HOLD (AT SIDE)



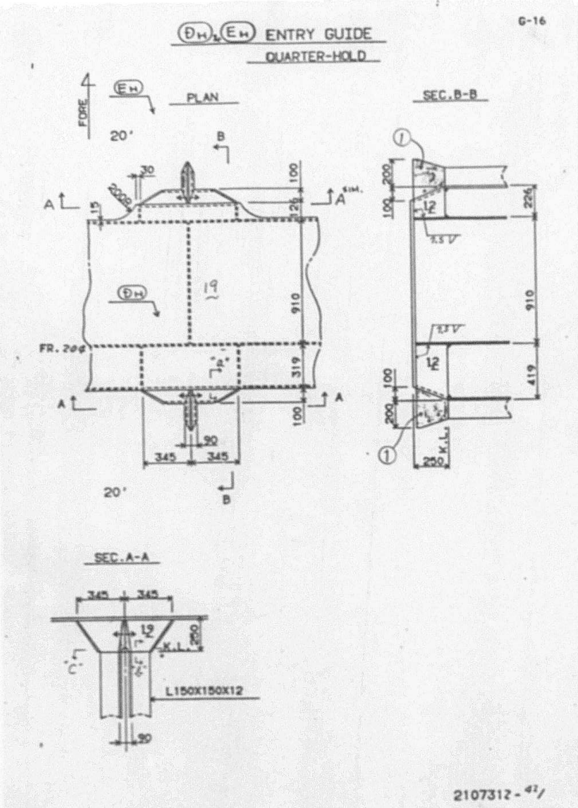
2107312 - 40/

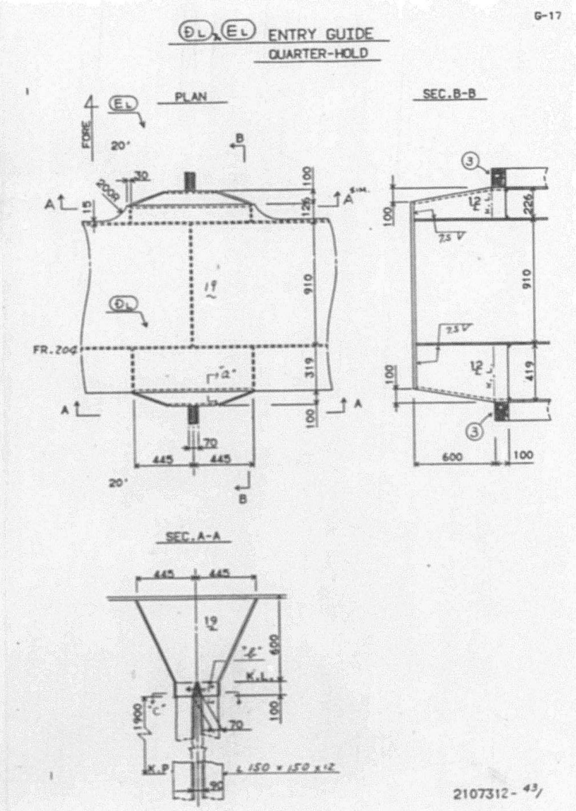
G-11

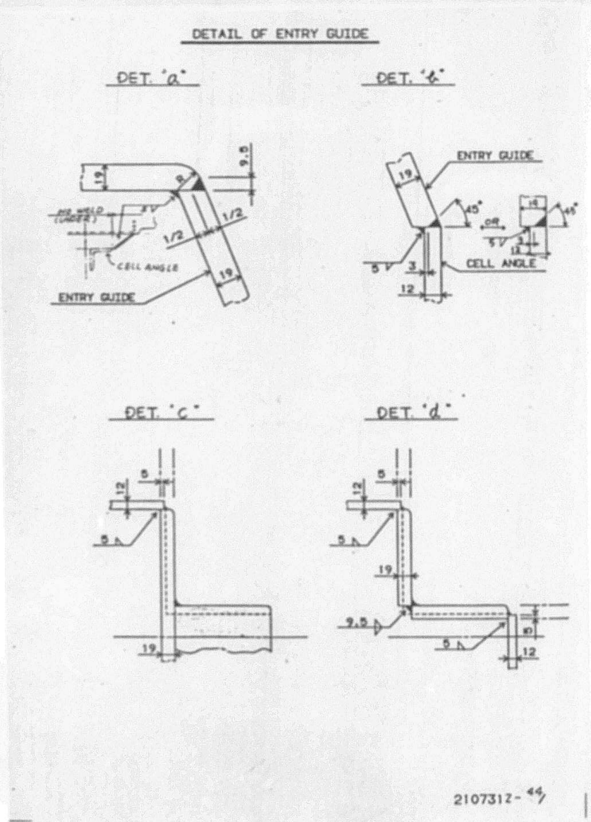
D_B E_B ENTRY GUIDE
QUARTER HOLD



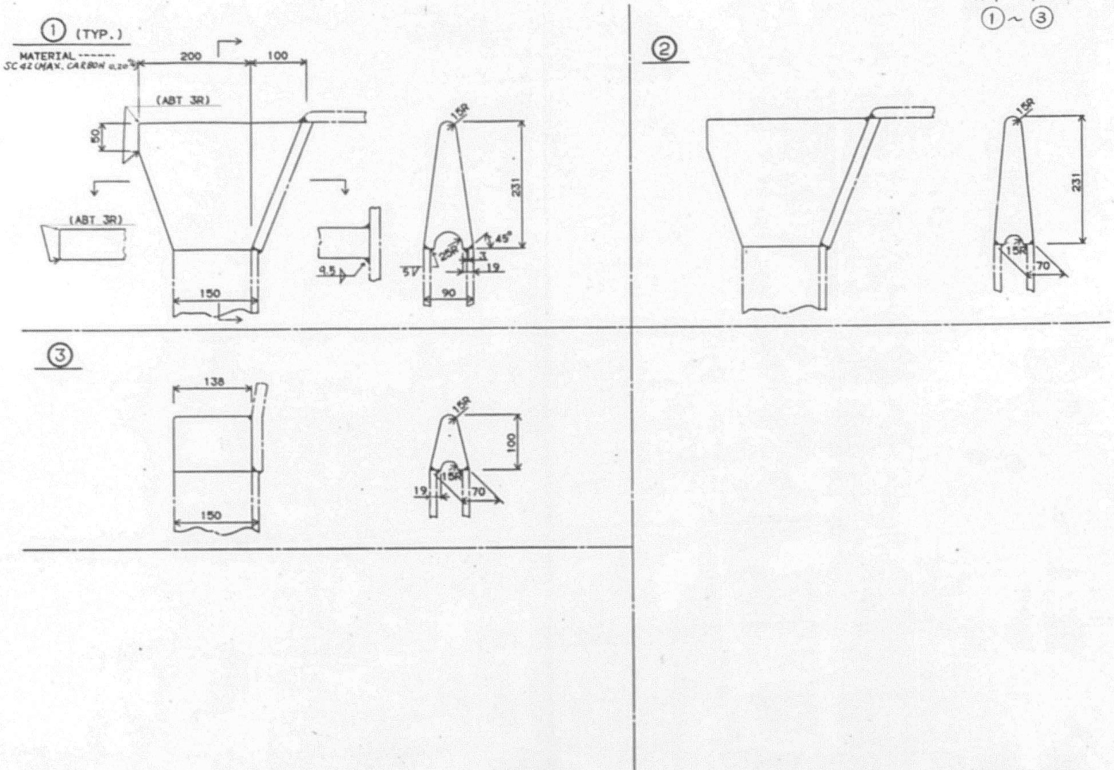
2107312 - 41/


G-16
DH, EH ENTRY GUIDE
QUARTER-HOLD
PLAN
SEC.B-B
SEC.A-A
FORE
20'
FR.206
L150X150X12
2107312-42/


G-17
DL, EL ENTRY GUIDE
QUARTER-HOLD
PLAN
SEC.B-B
SEC.A-A
FORE
20'
FR.206
L 150 × 150 × 12
2107312-43/


DETAIL OF ENTRY GUIDE
DET. 'a'
DET. 'b'
DET. 'c'
DET. 'd'
ENTRY GUIDE
CELL ANGLE
2107312-44/

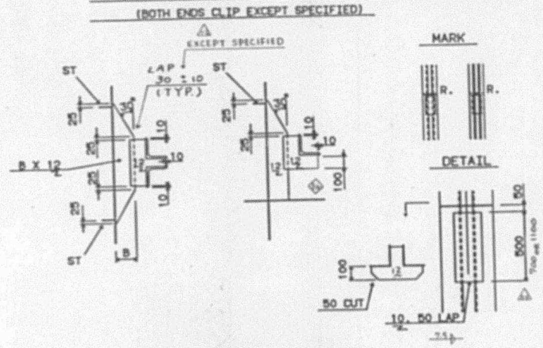
CAST STELL ①~③



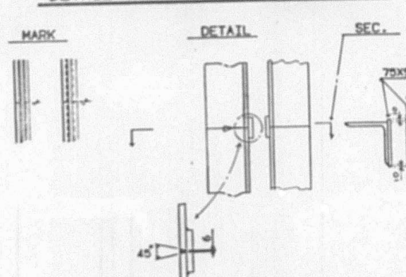
2107312 - 45/

TYPICAL CELL GUIDE RIB

1. WELD ---- 5 EXCEPT SPECIFIED.
2. LAP WELD ---- 10 EXCEPT SPECIFIED
3. ST MARK STIFF. ---- 90 X 9 F.B. (ST MARK TO BE FITTED.)
(BOTH ENDS CLIP EXCEPT SPECIFIED)



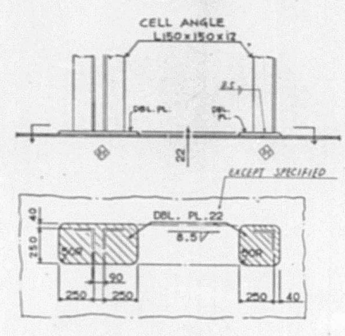
DETAIL OF CELL GUIDE CONNECTION

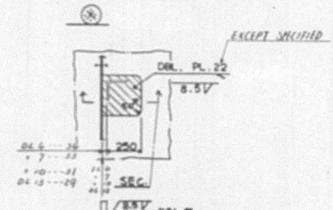


2107312-46

DETAIL OF LOW. END

TYPICAL

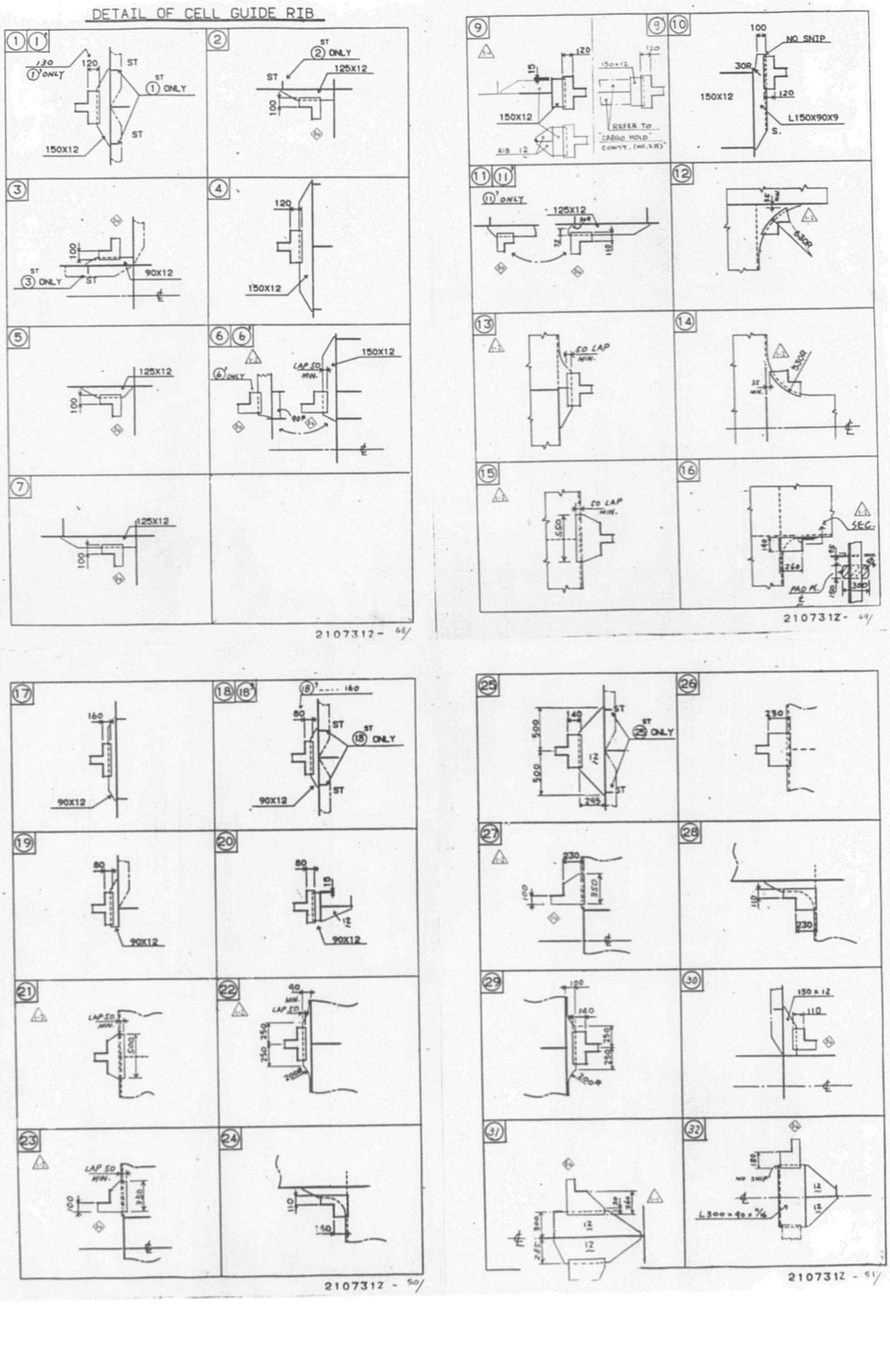




2107312 - 47/

592

DETAIL OF CELL GUIDE RIB



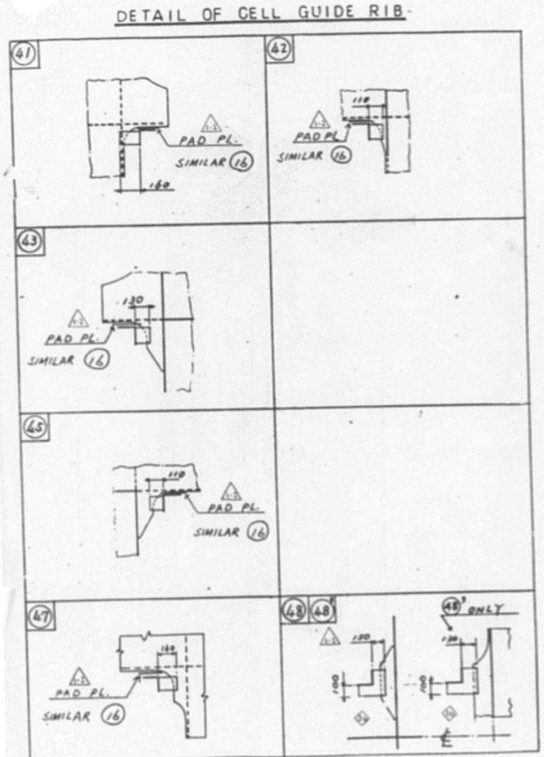
2107312 - 48/

2107312 - 49/

2107312 - 50/

2107312 - 51/

DETAIL OF CELL GUIDE RIB



Z107312 - 52/52

594

APPROVAL OF OWNER & REGULATORY BODIES

ALT. NO.	OWNER DATE	OWNER LETTER NO.	USCG DATE	USCG LETTER NO.	ABS DATE	ABS LETTER NO.	USPH DATE	USPH LETTER NO.
ORIGINAL	28AUG'86	OFTY/MES-473			11AUG'86	T-8-2		
1ST PART REV	11JUL'86	OFTY/MES-706			30AUG'86	T-8-2		
2ND PART REV	21JUL'86	TAM/24			1SEP'86	T-8-2		
3RD PART REV	11AUG'86	TAM/49			4OCT'86	T-8-2		

FINISHEDPLAN

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SHIPYARD AND SHIP'S NO. & NAME			
MITSUI TAMANO		MITSUBISHI KOBE	
NO.1323	DOCTOR LYKES	NO.1158	JAMES LYKES
NO.1324	ALMERIA LYKES	NO.1159	JOSEPH LYKES
NO.1325	TILLIE LYKES	NO.1164	SOLON TURMAN

MITSUI ENGINEERING & SHIPBUILDING CO.,LTD.
TAMANO WORKS

SHIP DESIGN DEPARTMENT — SHIP'S NO. 1325 — SHIP'S NAME TILLIE LYKES

STRUCTURE DESIGN SEC.

コンテナー支持構造(オ3,4倉)
CONT. SUPPORT CONST.(NO3&4H)

(TEL 3227)

JOB NO. TS1323/24/25 — SCALE 1/100 — LYKES REF. NO. 120505 — MITSUI DRAWING NO. 2107313

(48 SHEETS WITH COVER)

PLAN RECORD

ALT. NO.	MARK	ALTERATION/DESCRIPTION	DATE & SIGNATURE
		"PREPARED FOR S.NO.1323 AS FINISHED PLAN, MADE APPLICABLE TO S.NO.1324 AND S.NO.1325."	NOV.28.'86
		FOR APL MODIFICATIONS. THIS DRAWING WAS MODIFIED PARTLY, AND THERE WERE SHOWN ON 'MODIFICATION PLAN OF No.4 HOLD(AFT) CONT. SUPP (20'×2 → 45')' (HES DRW No. 2107320H PAGE 3~10)	

DWG.NO. 2107313-1/

NOTES:-

1. BOTH SIDES TO BE SYMMETRICAL EXCEPT SPECIFIED.
2. TRANS. SECTIONS TO BE "LOOKING FORE" EXCEPT SPECIFIED.
3. REFER TO "CONSTRUCTION DETAILS (DWG NO. 2100811)" FOR STRUCTURAL DETAILS OF MEMBERS, ETC. EXCEPT SPECIFIED.
4. REFER TO "WELDING TABLE (DWG NO. 2100832)" FOR LEG LENGTH OF WELDING EXCEPT SPECIFIED.

備考:-

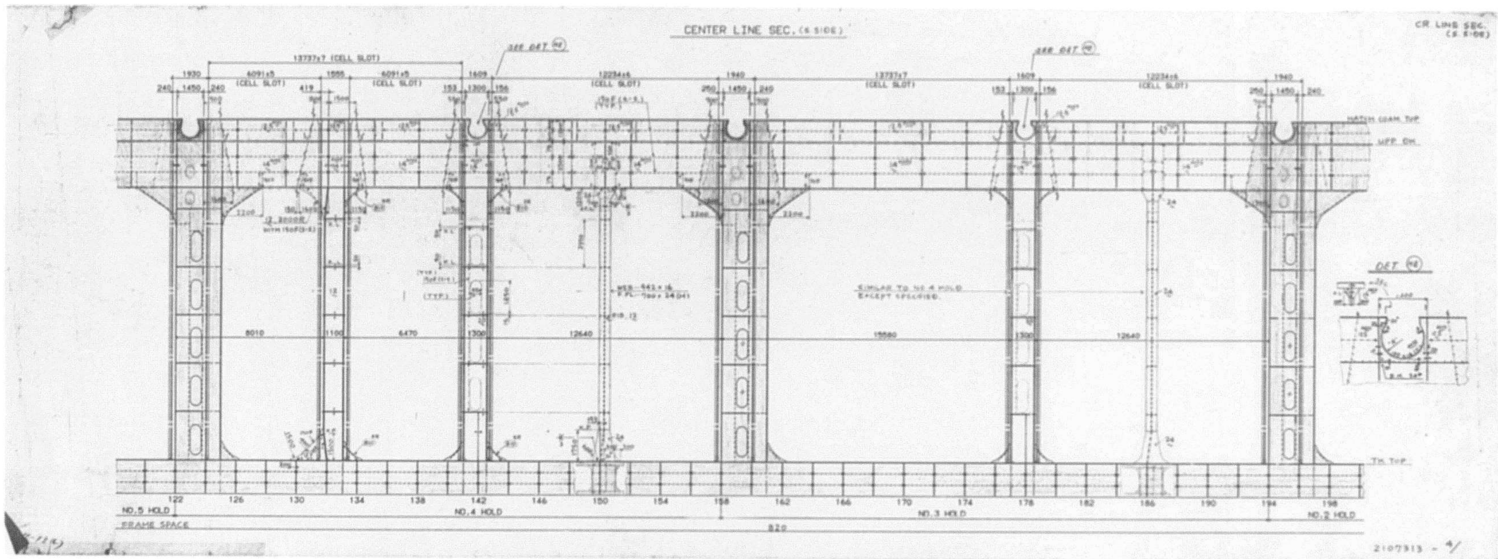
1. 特記の他は，両舷対称とする。
2. 横断面図は，特記の他は後面を示す。
3. 構造詳細については，特記の他は "構造詳細図(図番2100811)" を参照のこと。
4. 脚長については，特記の他は "溶接脚長表(図番2100832)" を参照のこと。

2107313-2/

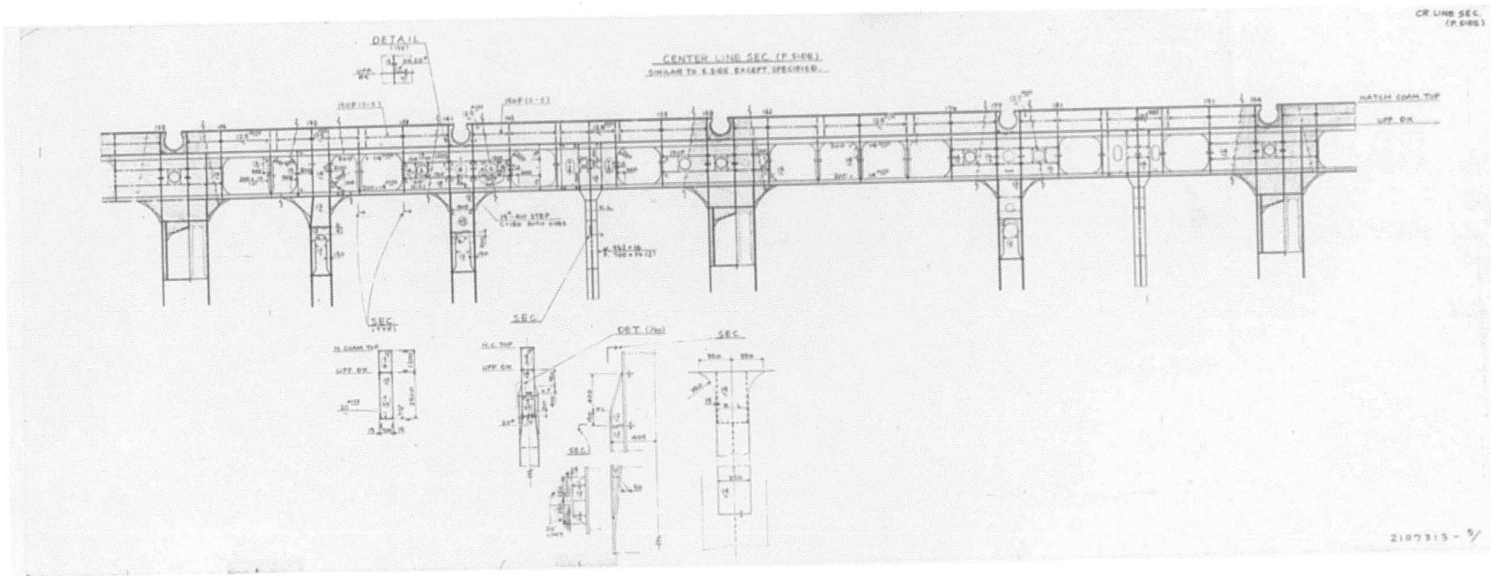
MATERIAL LIST

	ITEM	MTERIAL	NO	WEIGHT (kg/PIECE)	SHOP (INFORMATION FOR MES ONLY)	ARR. NO.
①	ENTRY GUIDE	(STEEL CASTING) SC42	16	20.60	1.462	—
②	"	"	16	18.03	"	—
③	"	"	32	4.62	"	—
④	"	"	8	36.24	"	—
⑤	"	"	8	11.05	"	—

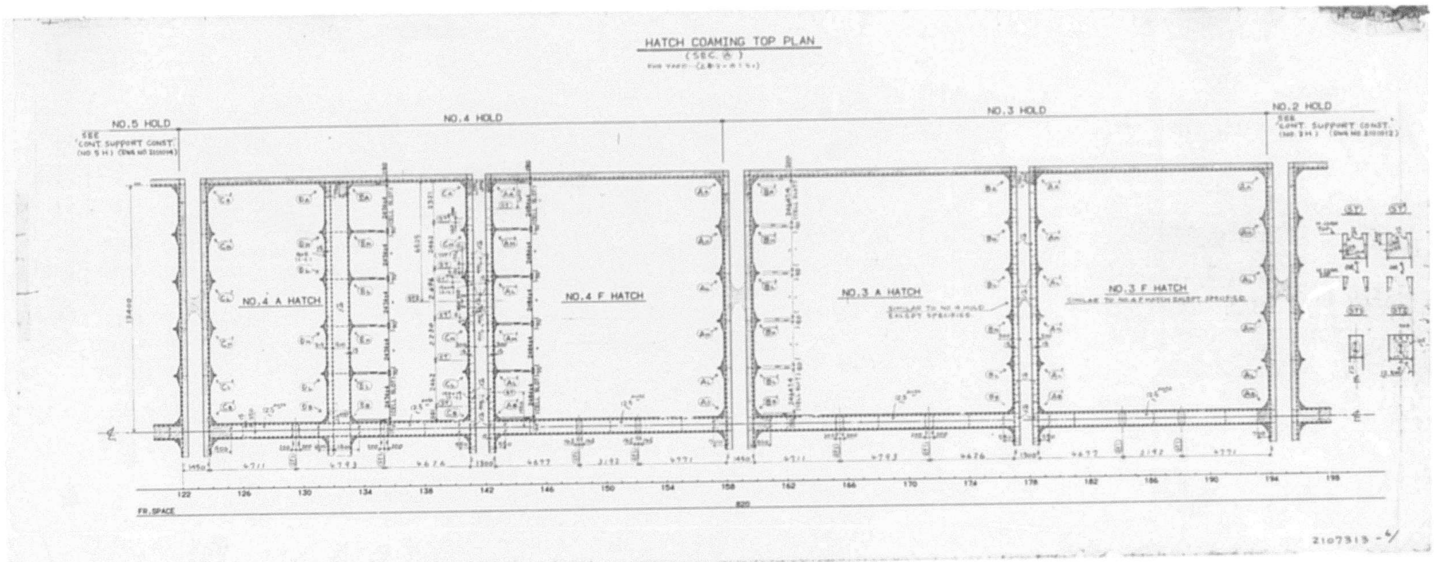
2107313-3/

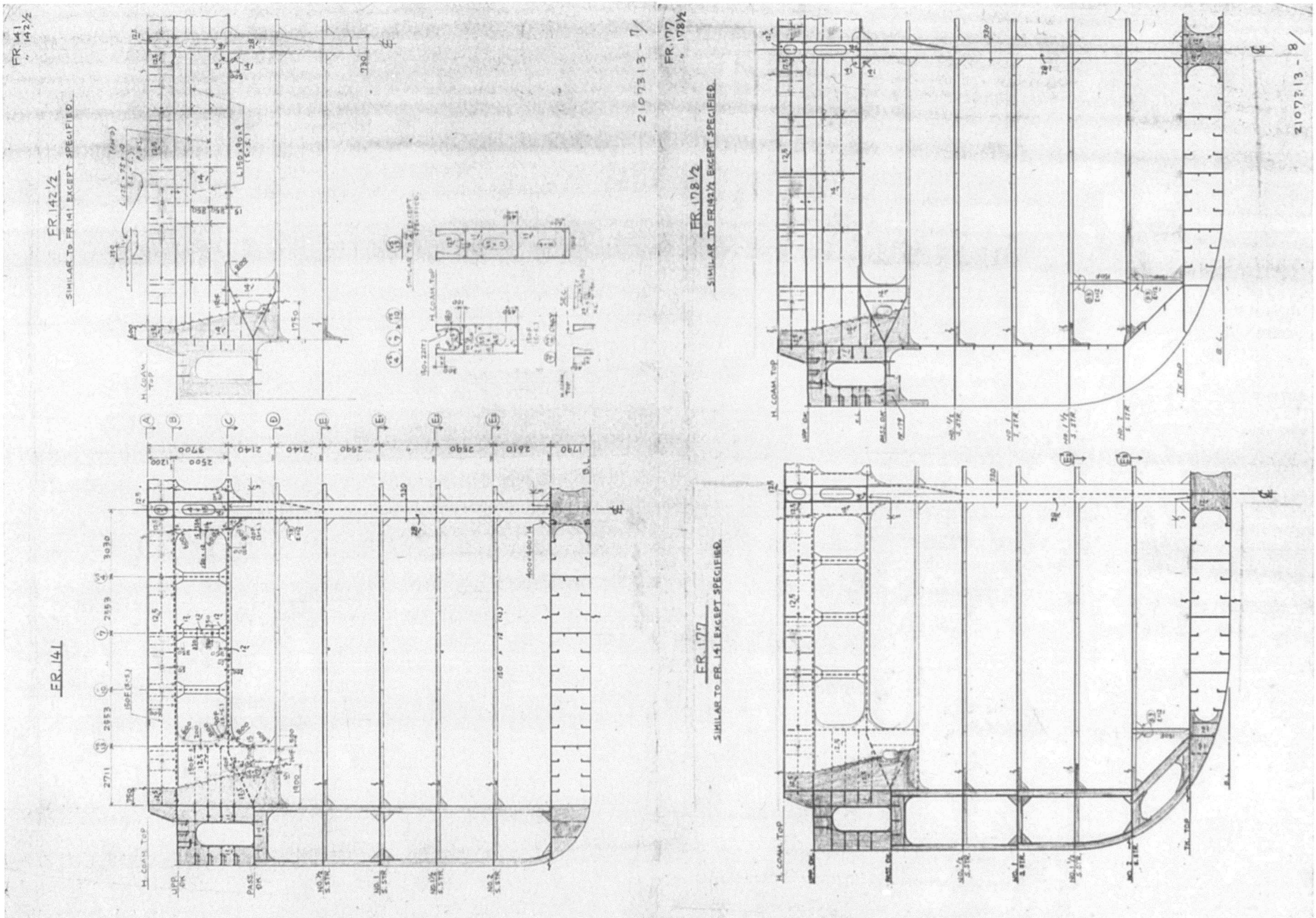

CENTER LINE SEC. (S.SIDE)
SEE DET
DET
NO.5 HOLD
NO.4 HOLD
NO.3 HOLD
NO.2 HOLD
FRAME SPACE
SIMILAR TO NO.4 HOLD EXCEPT SPECIFIED.
HATCH COAM. TYP.
UPP. DK.
TK. TOP
2107313 - 4/

596


CR LINE SEC.
(P SIDE)
DETAIL
CENTER LINE SEC. (P SIDE)
SIMILAR TO S SIDE EXCEPT SPECIFIED.
HATCH COAM TOP
UPP. DK
SEC.
SEC.
DET.
SEC.
SEC.
2107313-3/

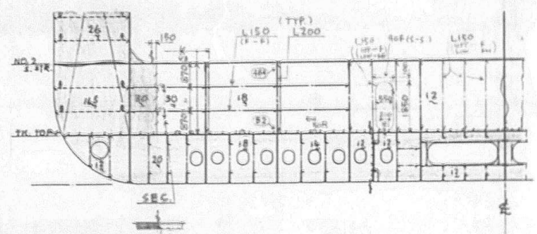
597


HATCH COAMING TOP PLAN
NO.5 HOLD
NO.4 HOLD
NO.3 HOLD
NO.2 HOLD
NO.4 A HATCH
NO.4 F HATCH
NO.3 A HATCH
NO.3 F HATCH
FR.SPACE
2107313-4


FR 141
FR 142½
SIMILAR TO FR 141 EXCEPT SPECIFIED
FR 177
SIMILAR TO FR 141 EXCEPT SPECIFIED
FR 178½
SIMILAR TO FR 142½ EXCEPT SPECIFIED
2107313 - 7
21073.13 - 8
H. COAM TOP

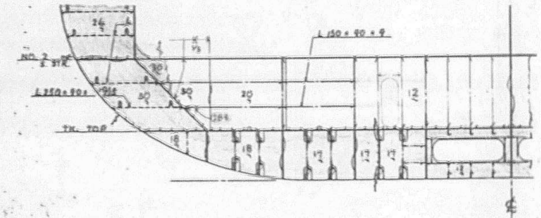
599

FR. 142



FR. 178

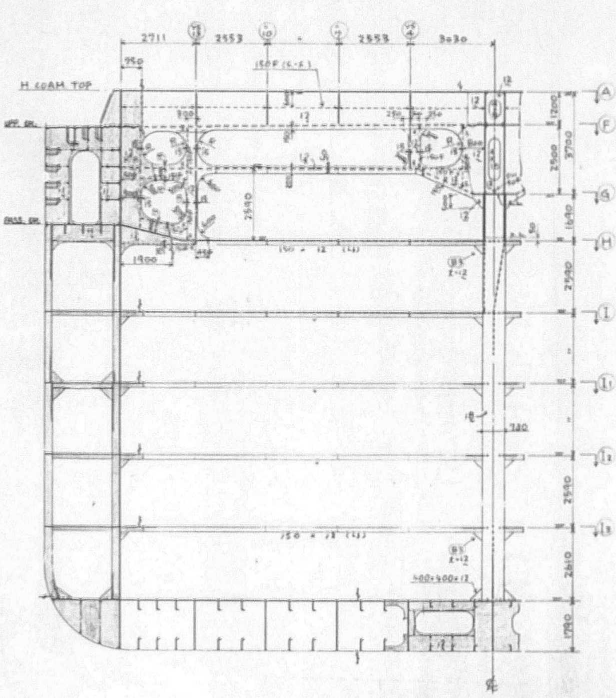
SIMILAR TO FR 142 EXCEPT SPECIFIED



2107313 - 9/

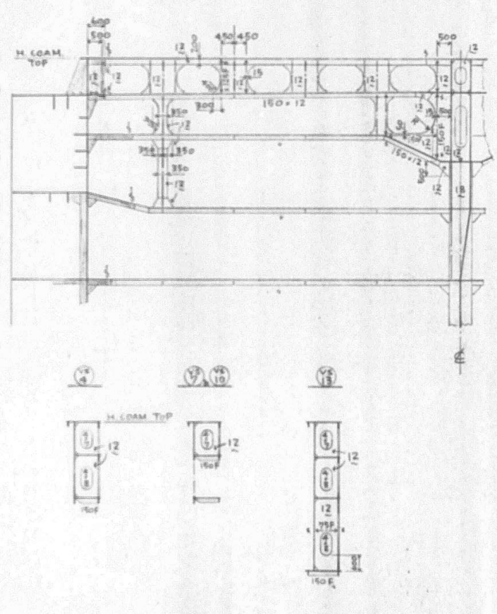
FR. 132
" 133½

FR. 132



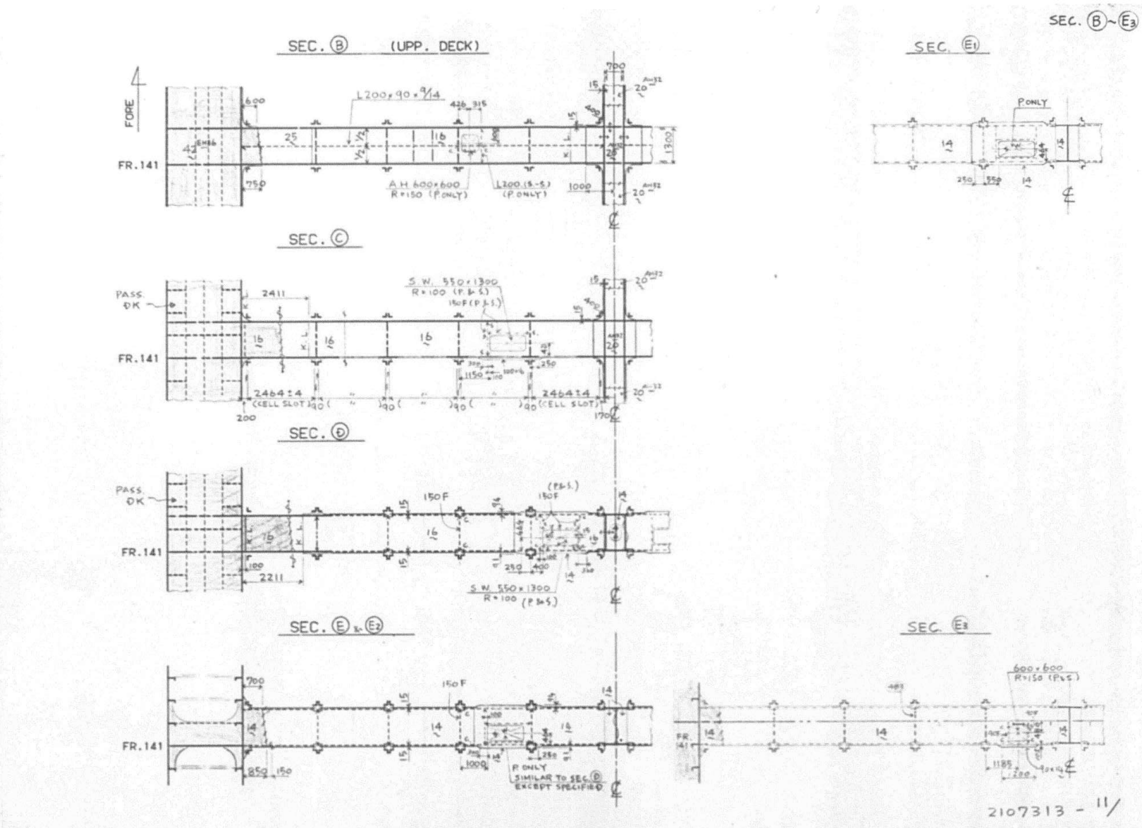
FR. 133½

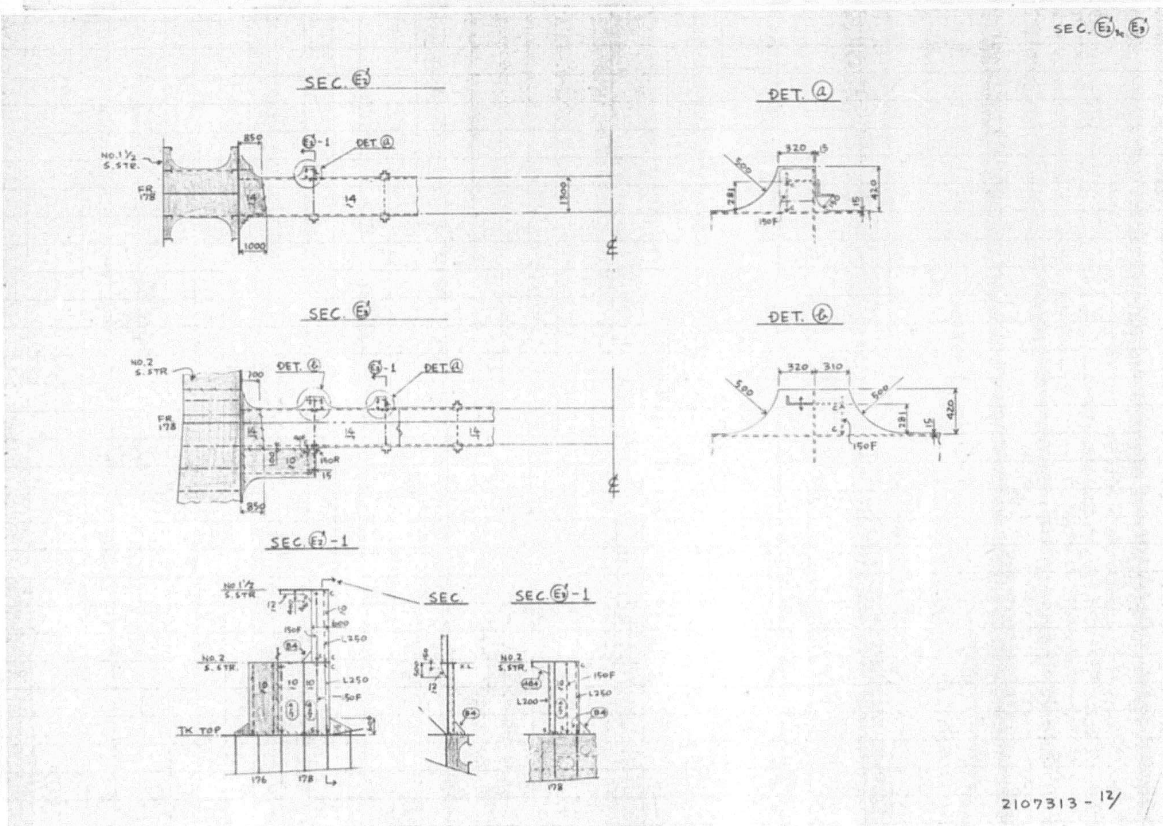
SIMILAR TO FR 132 EXCEPT SPECIFIED.



2107313 - 10/

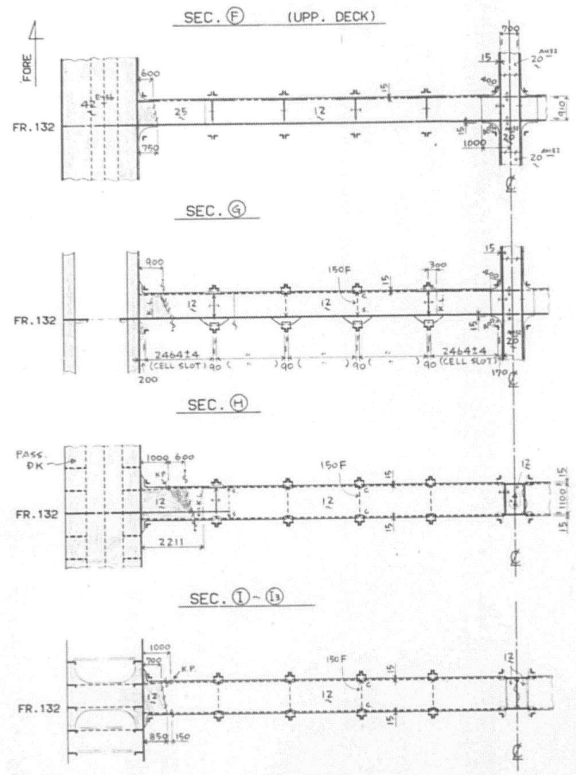
600


SEC. B ~ E3
SEC. B (UPP. DECK)
SEC. E1
SEC. C
SEC. D
SEC. E & E2
SEC. E3
FORE
FR. 141
PASS. DK
P ONLY
SIMILAR TO SEC. D EXCEPT SPECIFIED
2107313 - 11/


SEC. E2' & E3'
SEC. E2'
SEC. E3'
DET. a
DET. b
SEC. E2'-1
SEC.
SEC. E3'-1
FR 178
TK TOP
2107313 - 12/

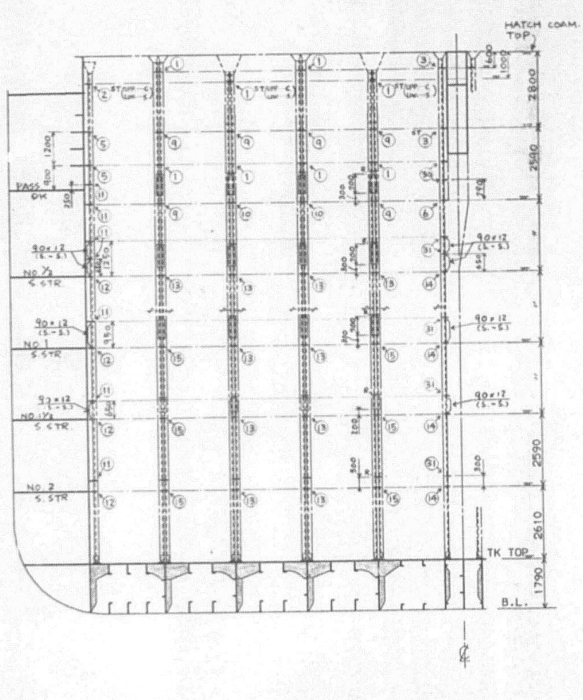
601

SEC. (F) ~ (I3)



2107313 - 13/

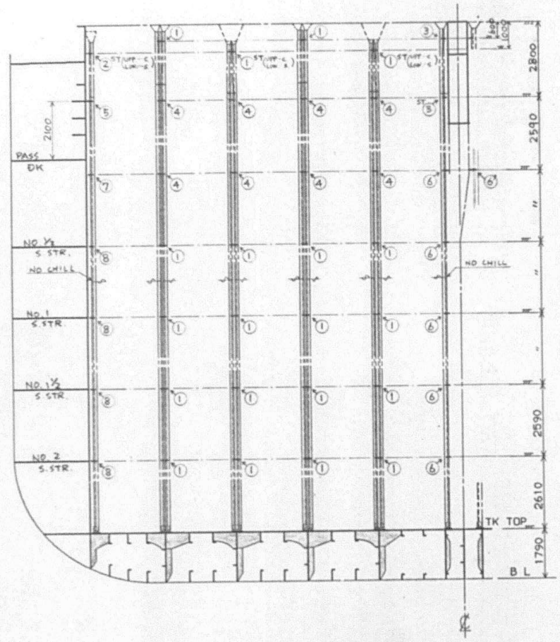
FR. 123 FORE



2107313 - 14/

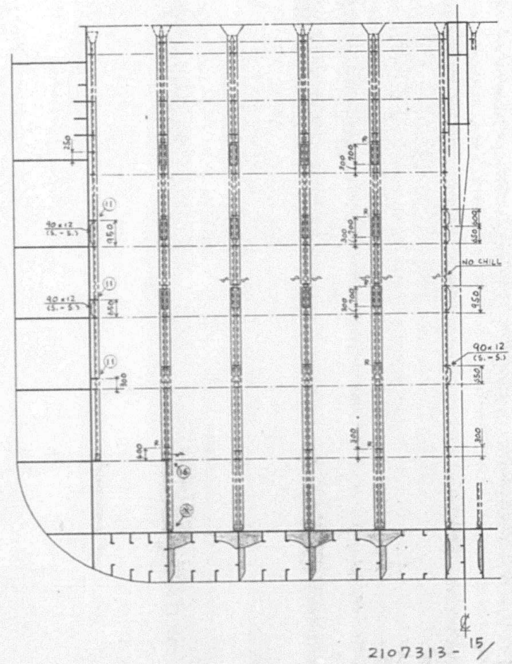
FR.158 AFT
" 159 FORE

FR.158 AFT



FR.159 FORE

SIMILAR TO FR.123 FORE EXCEPT SPECIFIED.

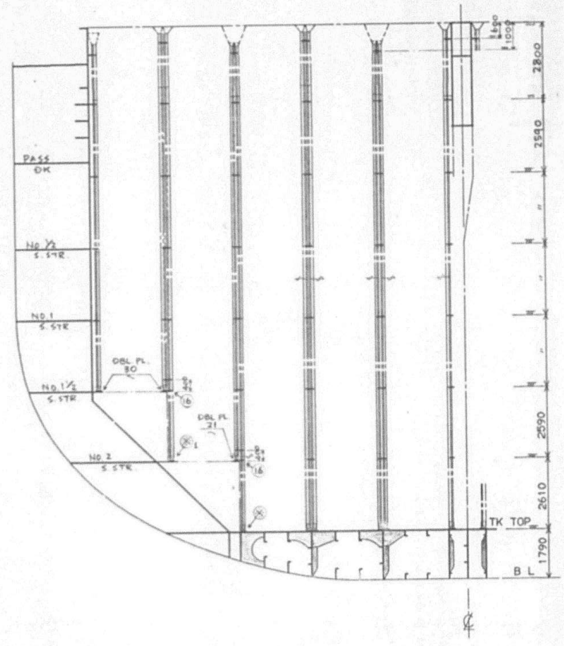


2107313-15/

FR.194 AFT

FR.194 AFT

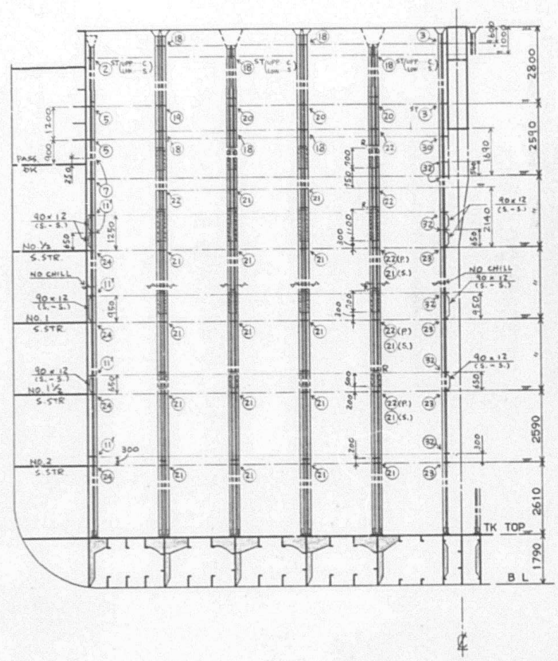
SIMILAR TO FR.158 AFT EXCEPT SPECIFIED.



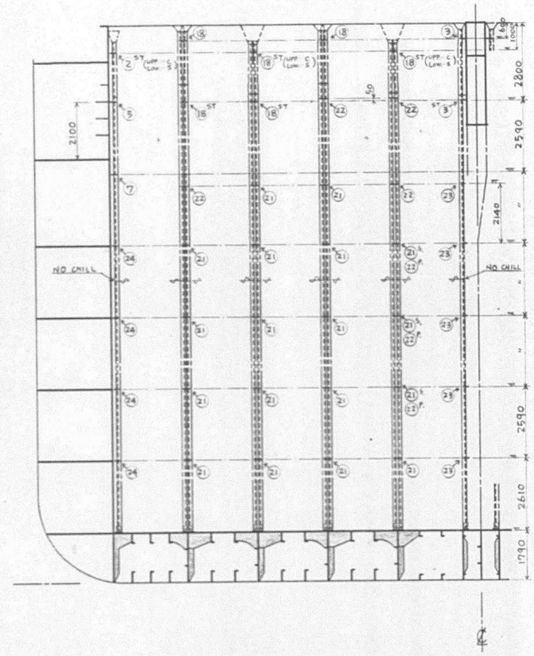
2107313-16/

FR. 141 AFT
" 142 FORE

FR. 141 AFT



FR. 142 FORE

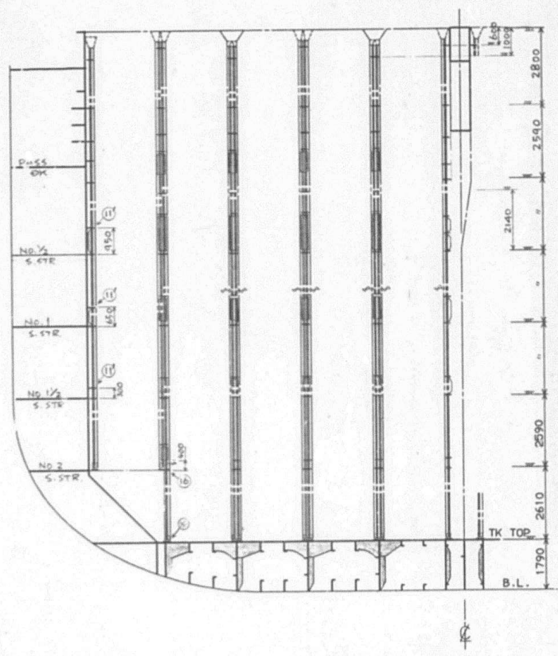


2107313 - 17/

FR. 177 AFT
" 178 FORE

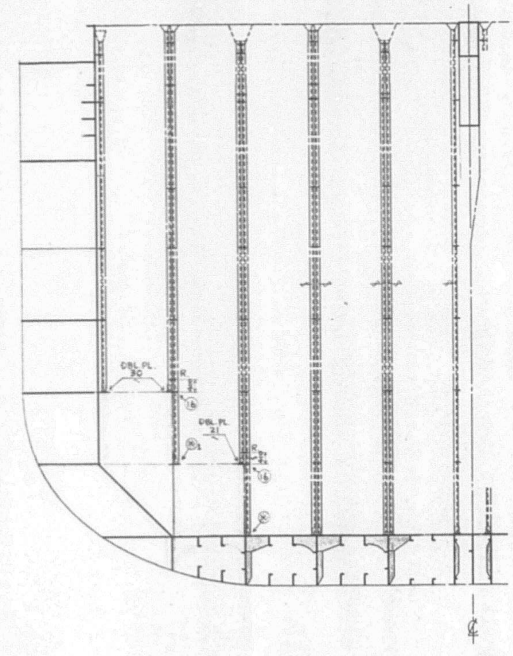
FR. 177 AFT

SIMILAR TO FR. 141 AFT EXCEPT SPECIFIED

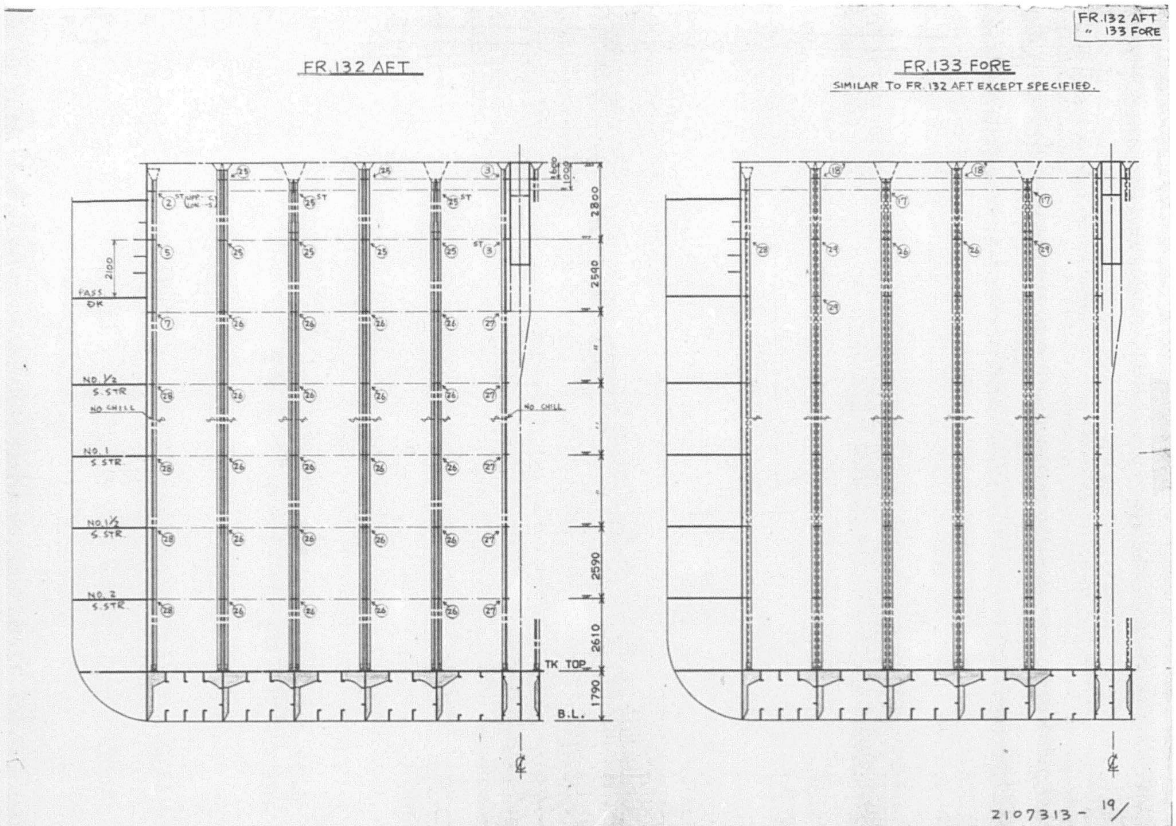


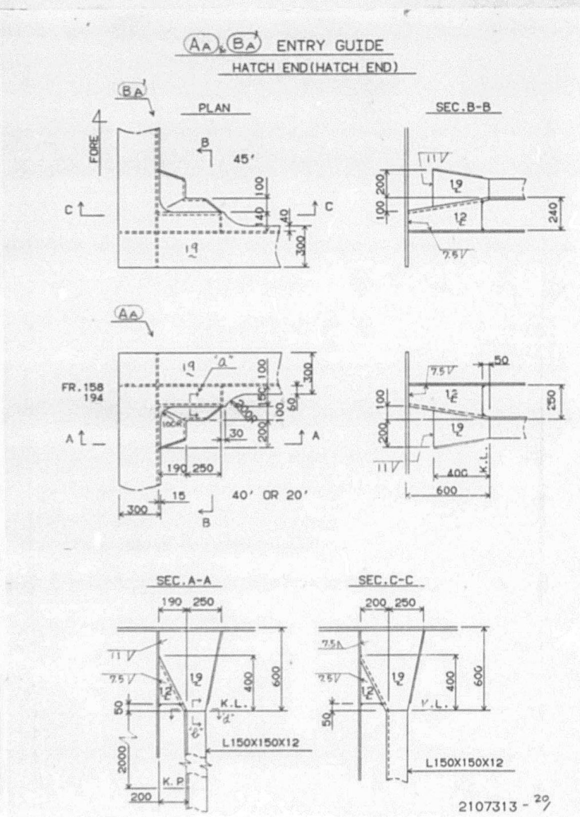
FR. 178 FORE

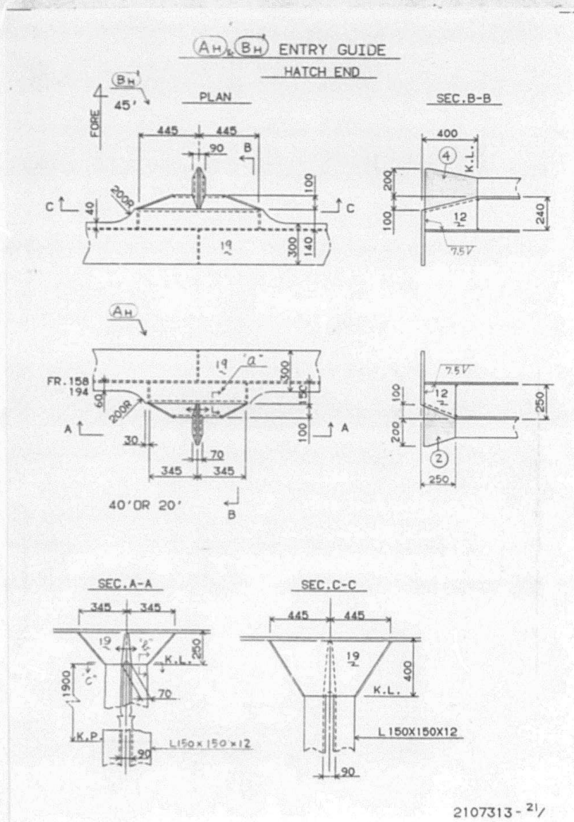
SIMILAR TO FR. 142 FORE EXCEPT SPECIFIED



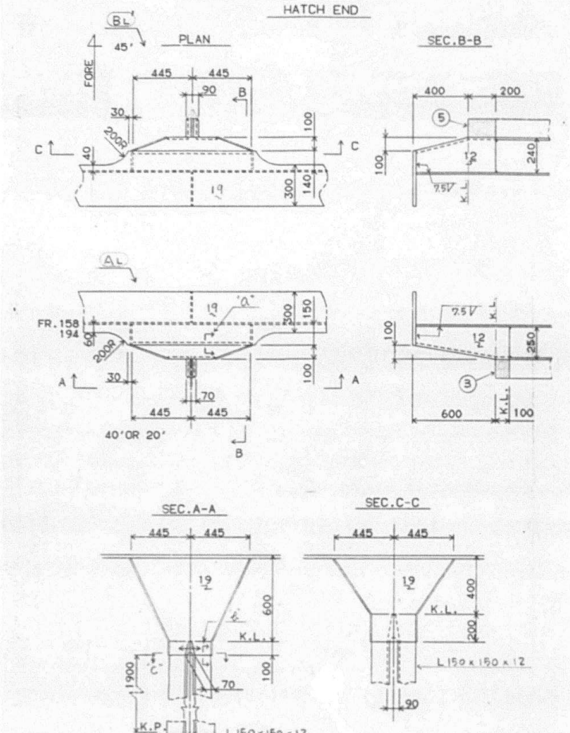
2107313 - 18/


FR.132 AFT
" 133 FORE
FR.132 AFT
FR.133 FORE
SIMILAR TO FR.132 AFT EXCEPT SPECIFIED.
PASS. DK
NO.½ S.STR
NO CHILL
NO.1 S.STR.
NO.1½ S.STR.
NO.2 S.STR.
TK TOP
B.L.
2800
2590
2610
1790
2100
2107313-19/


AA & BA ENTRY GUIDE
HATCH END (HATCH END)
PLAN
SEC.B-B
FORE
45'
FR.158
194
40' OR 20'
SEC.A-A
SEC.C-C
K.L.
K.P
L150X150X12
2107313-20/

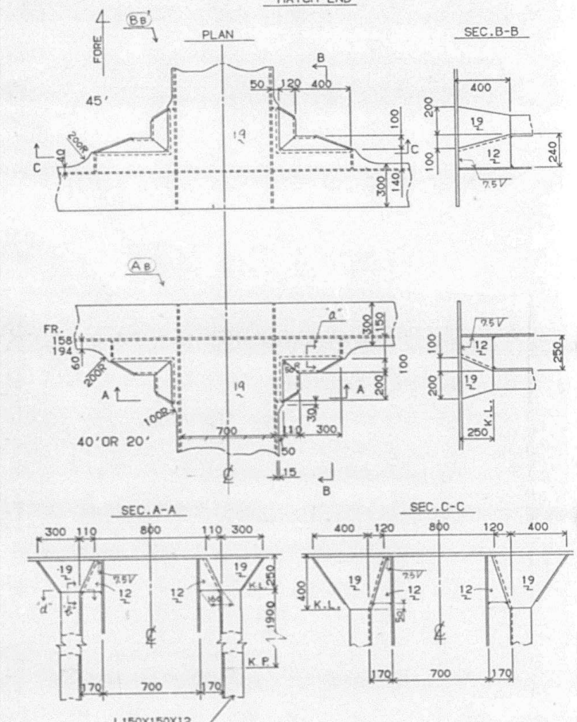

AH & BH ENTRY GUIDE
HATCH END
PLAN
SEC.B-B
FORE
45'
FR.158
194
40' OR 20'
SEC.A-A
SEC.C-C
K.L.
K.P
L150X150X12
2107313-21/

(AL), (BL) ENTRY GUIDE
HATCH END



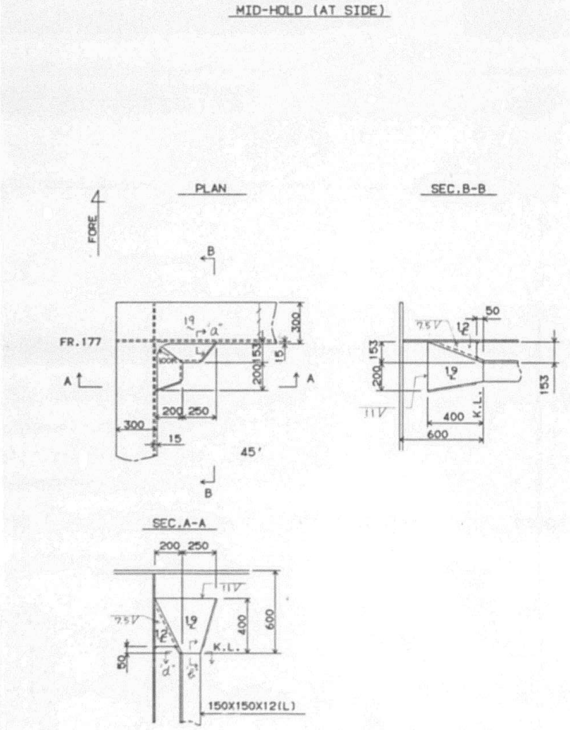
2107313-22/

(AB), (BB) ENTRY GUIDE
HATCH END



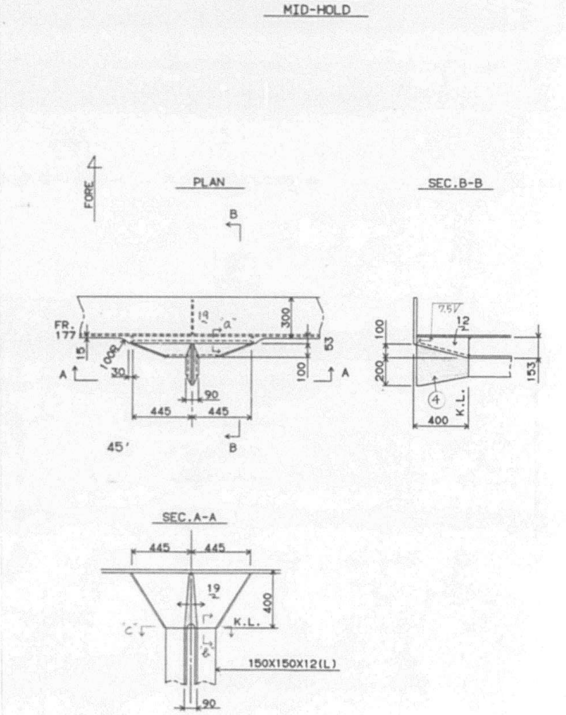
2107313-23/

(BA) ENTRY GUIDE
MID-HOLD (AT SIDE)



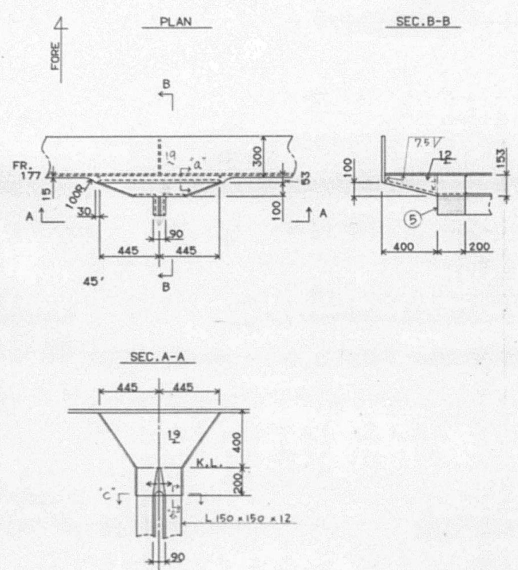
2107313-24/

(BH) ENTRY GUIDE
MID-HOLD



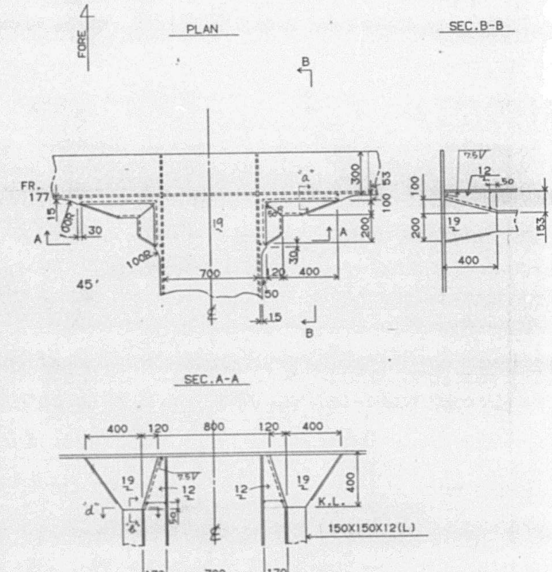
2107313-25/

(BL) ENTRY GUIDE
MID-HOLD



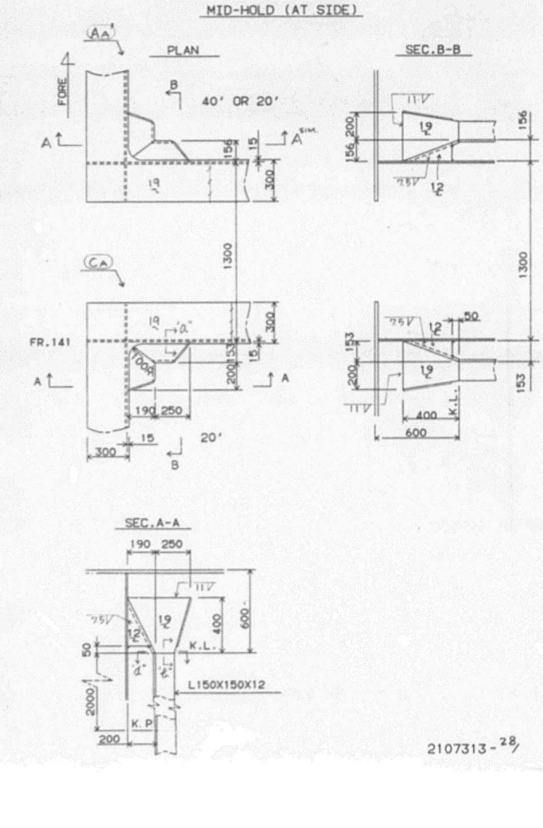
2107313-26/

(BB) ENTRY GUIDE
MID-HOLD



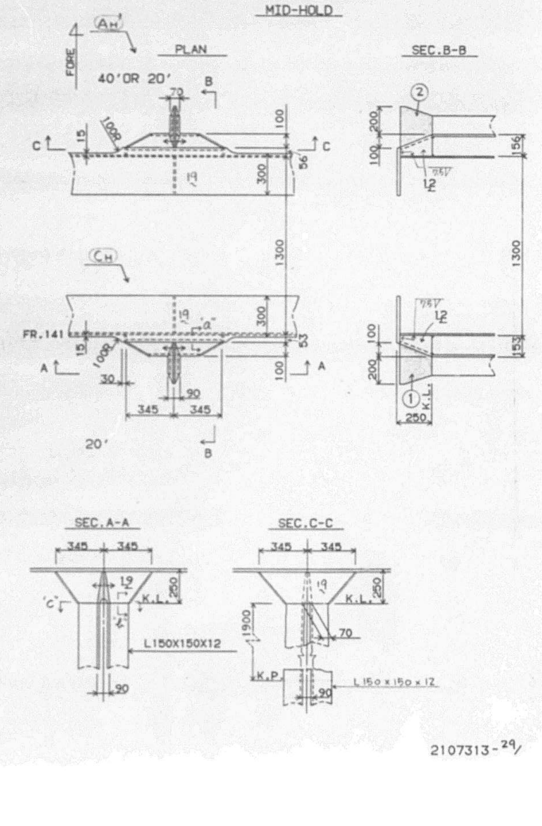
2107313-27/

(CA) & (AA) ENTRY GUIDE
MID-HOLD (AT SIDE)

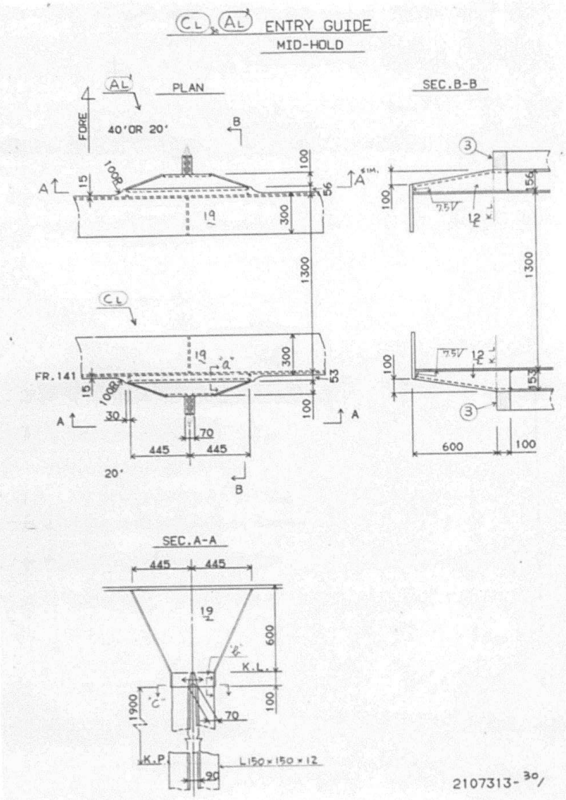


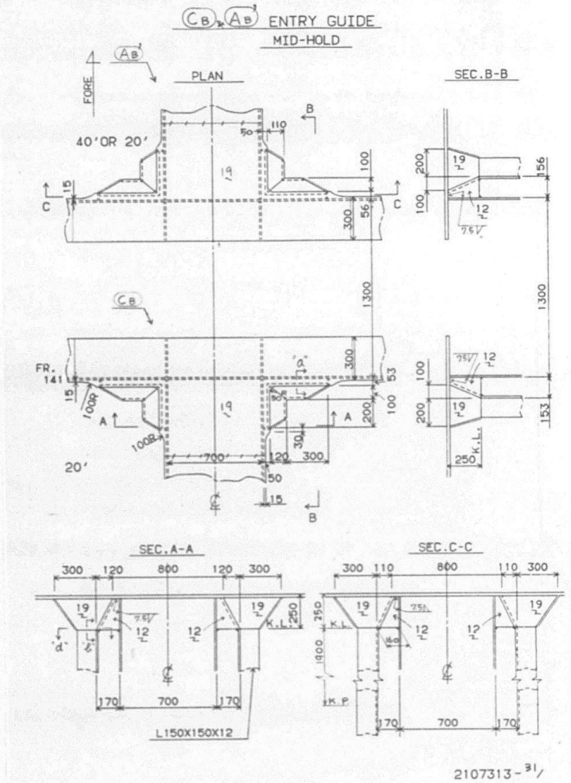
2107313-28/

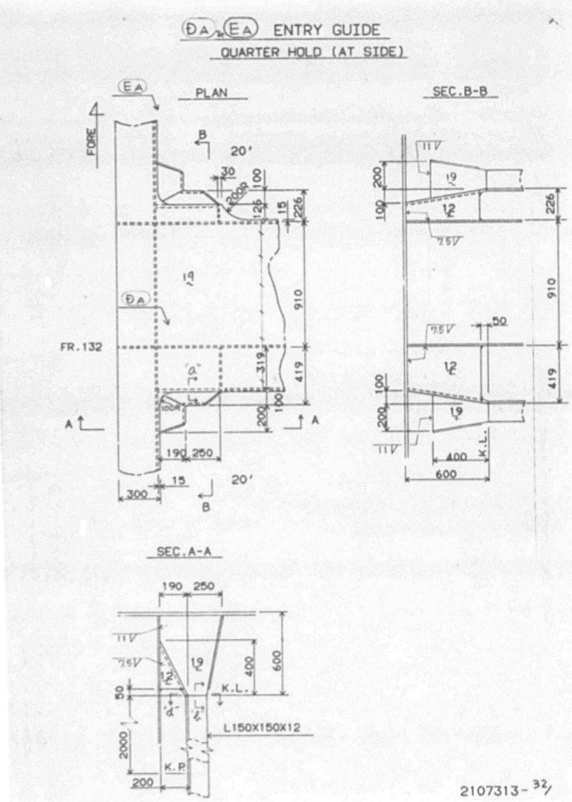
(CH) & (AH) ENTRY GUIDE
MID-HOLD

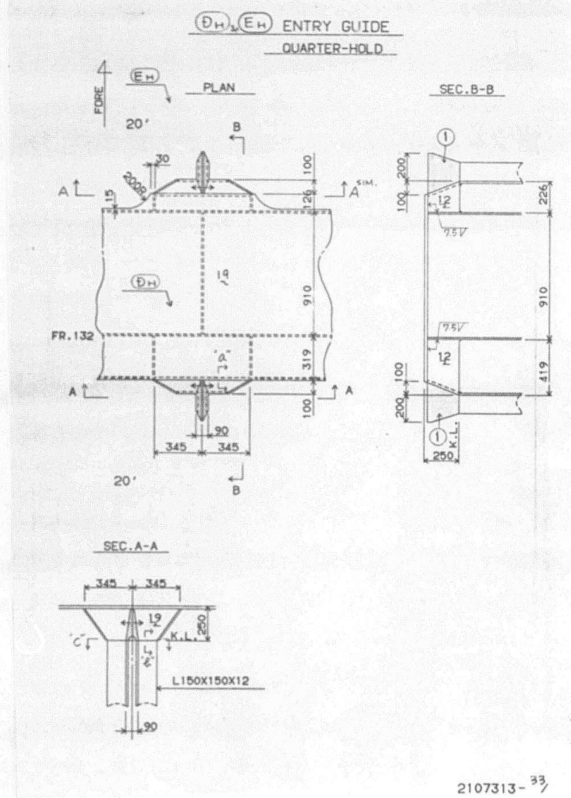


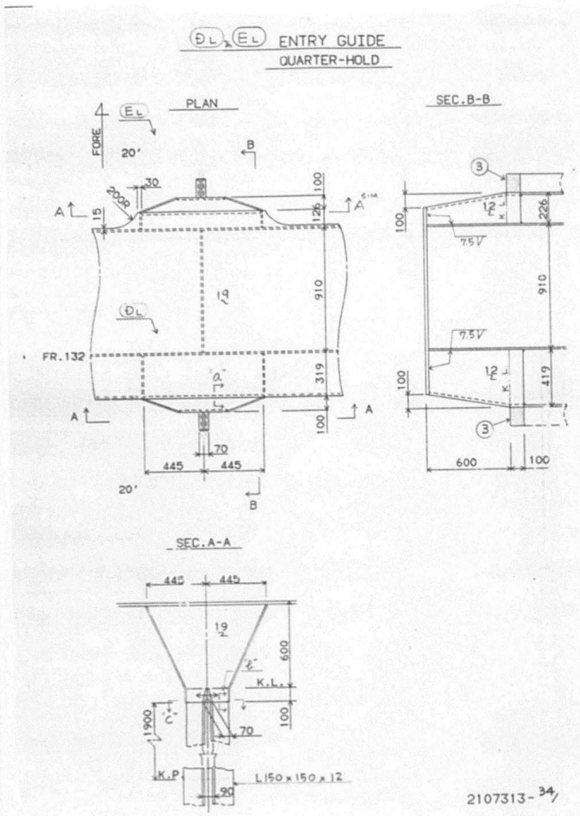
2107313-29/

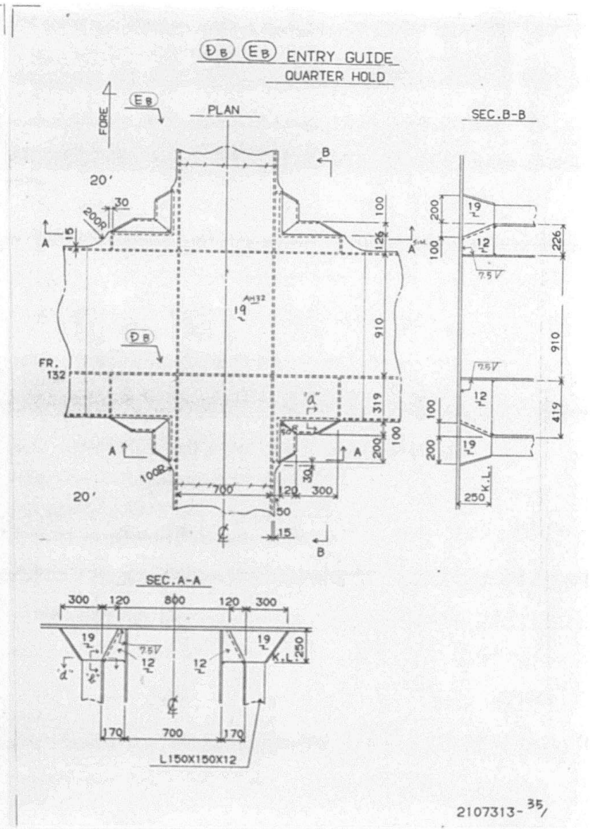

CL, AL ENTRY GUIDE
MID-HOLD
PLAN
SEC.B-B
SEC.A-A
FORE
40'OR 20'
20'
FR.141
L150×150×12
K.L.
K.P
2107313-30

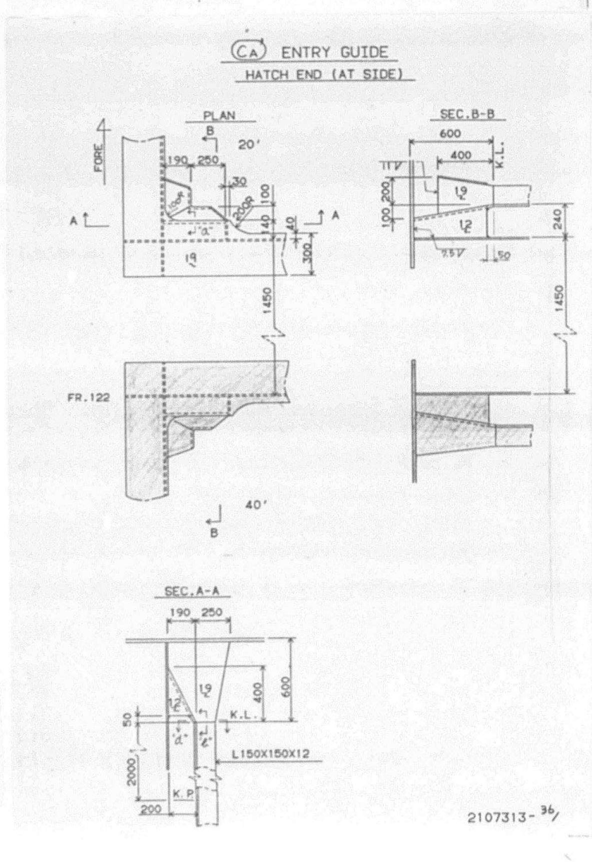

CB, AB ENTRY GUIDE
MID-HOLD
PLAN
SEC.B-B
SEC.A-A
SEC.C-C
FORE
40'OR 20'
20'
FR. 141
L150X150X12
K.L.
K.P
2107313-31

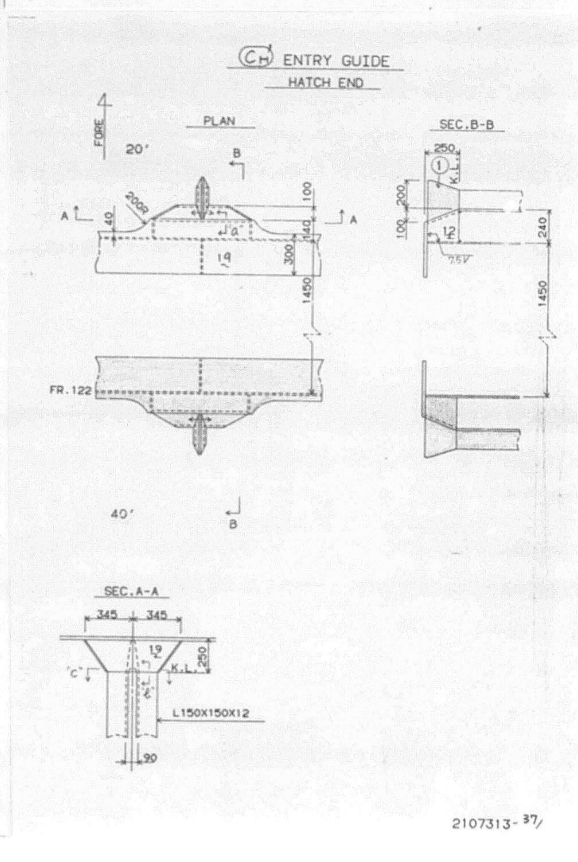

DA, EA ENTRY GUIDE
QUARTER HOLD (AT SIDE)
PLAN
SEC.B-B
SEC.A-A
FORE
20'
FR.132
L150X150X12
K.L.
K.P
2107313-32

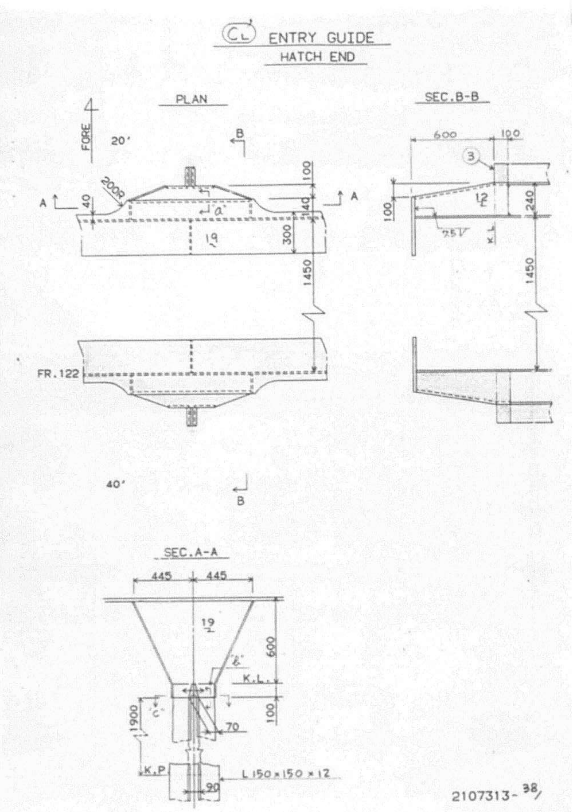

DH, EH ENTRY GUIDE
QUARTER-HOLD
PLAN
SEC.B-B
SEC.A-A
FORE
20'
FR.132
L150X150X12
K.L.
2107313-33

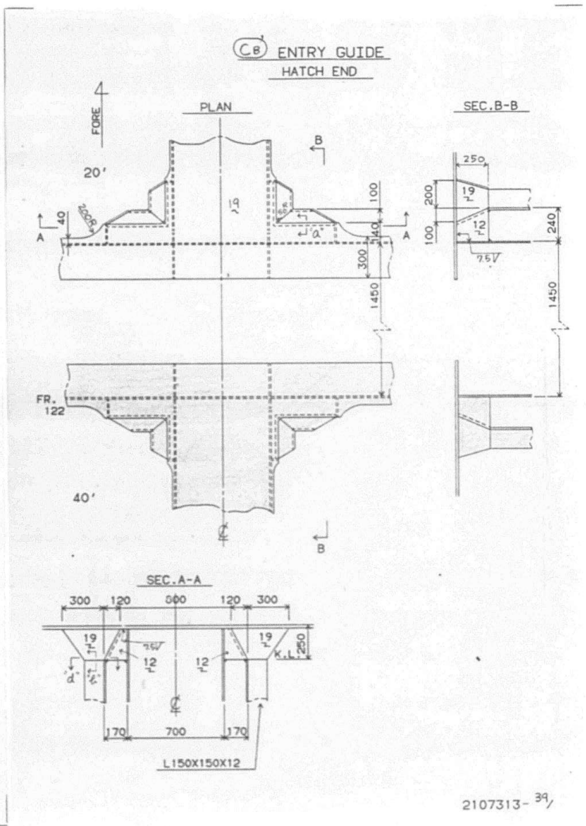

DL, EL ENTRY GUIDE
QUARTER-HOLD
PLAN
SEC.B-B
FORE
20'
FR.132
SEC.A-A
L150×150×12
K.P
2107313-34

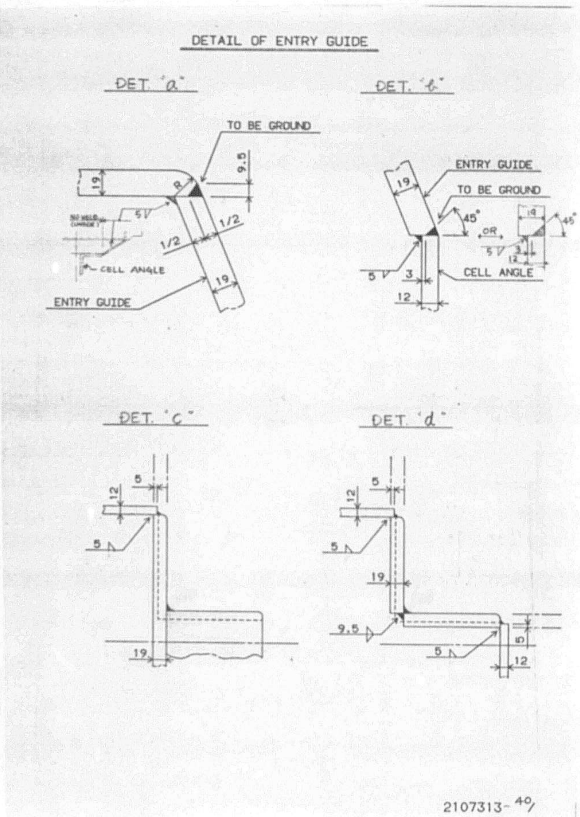

DB EB ENTRY GUIDE
QUARTER HOLD
PLAN
SEC.B-B
FORE
20'
FR. 132
SEC.A-A
L150X150X12
2107313-35

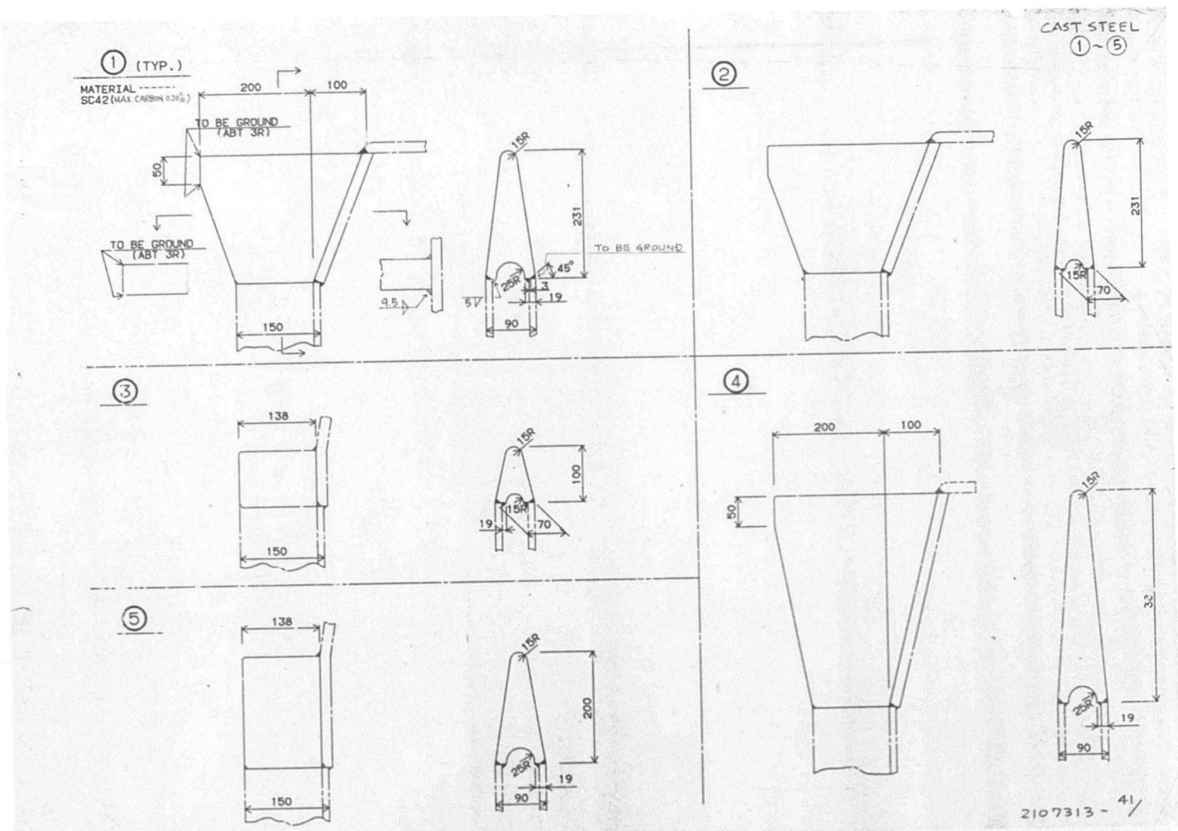

CA ENTRY GUIDE
HATCH END (AT SIDE)
PLAN
SEC.B-B
FORE
20'
FR.122
40'
SEC.A-A
L150X150X12
K.P
2107313-36

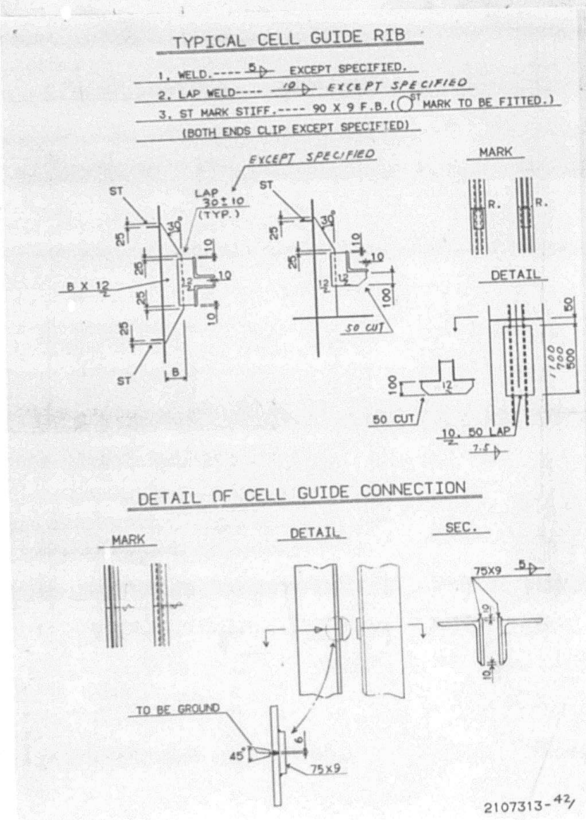

CH ENTRY GUIDE
HATCH END
PLAN
SEC.B-B
FORE
20'
FR.122
40'
SEC.A-A
L150X150X12
2107313-37

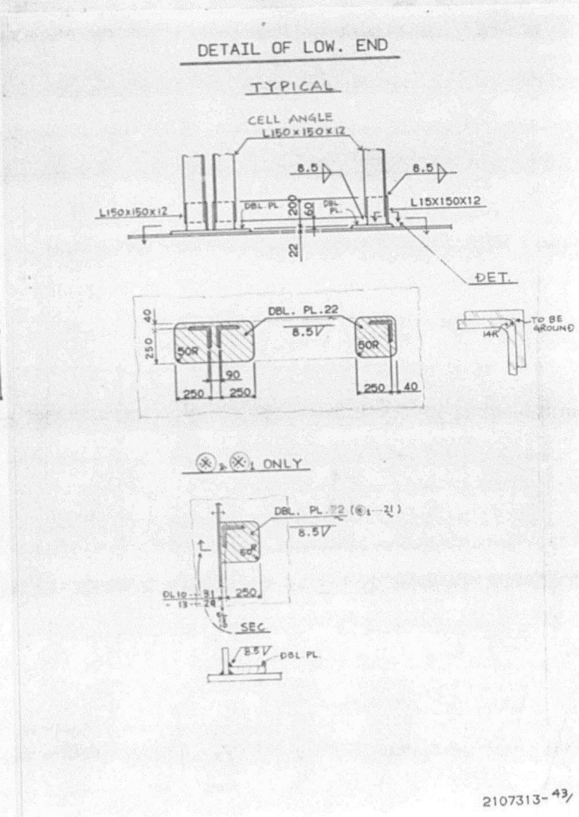

ENTRY GUIDE
HATCH END
PLAN
SEC.B-B
FORE
20'
40'
FR.122
SEC.A-A
K.L.
K.P
L 150×150×12
2107313-38


ENTRY GUIDE
HATCH END
PLAN
SEC.B-B
FORE
20'
40'
FR. 122
SEC.A-A
K.L
L150X150X12
2107313-39

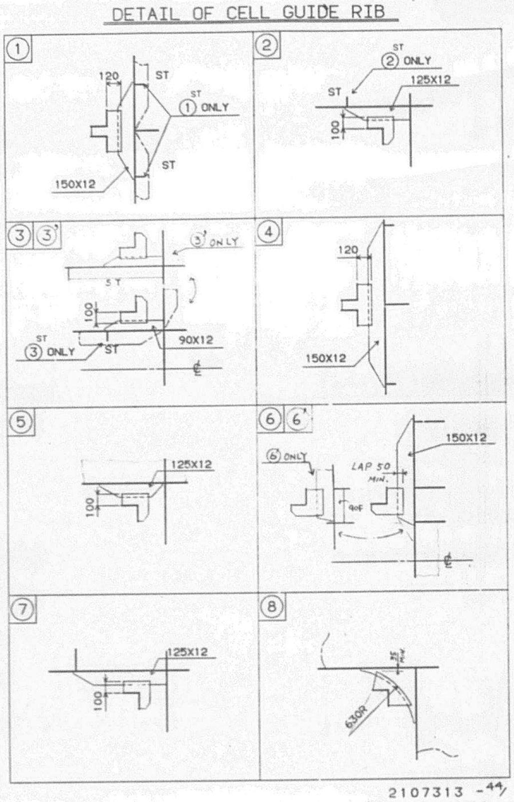

DETAIL OF ENTRY GUIDE
DET. "a"
DET. "b"
TO BE GROUND
ENTRY GUIDE
CELL ANGLE
DET. "c"
DET. "d"
2107313-40


CAST STEEL
①~⑤
① (TYP.)
MATERIAL ------
SC42 (MAX. CARBON 0.20%)
TO BE GROUND
(ABT 3R)
TO BE GROUND
(ABT 3R)
TO BE GROUND
②
③
④
⑤
15R
25R
231
200
100
138
150
90
19
70
45°
2107313-41

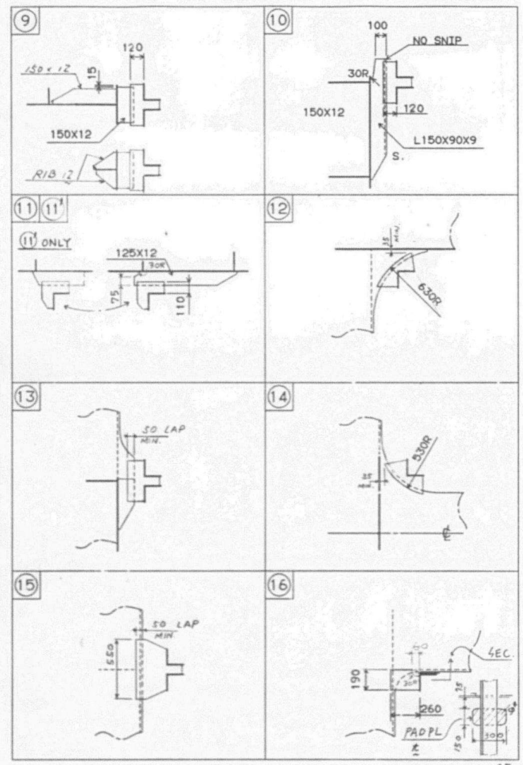

TYPICAL CELL GUIDE RIB
1. WELD.---- 5 EXCEPT SPECIFIED.
2. LAP WELD---- 10 EXCEPT SPECIFIED
3. ST MARK STIFF.---- 90 X 9 F.B.(ST MARK TO BE FITTED.)
(BOTH ENDS CLIP EXCEPT SPECIFIED)
EXCEPT SPECIFIED
MARK
DETAIL
ST
LAP
30±10
(TYP.)
50 CUT
10, 50 LAP
DETAIL OF CELL GUIDE CONNECTION
MARK
DETAIL
SEC.
75X9
TO BE GROUND
2107313-42


DETAIL OF LOW. END
TYPICAL
CELL ANGLE
L150×150×12
L150×150×12
L15X150X12
DBL. PL
DET.
TO BE GROUND
DBL. PL.22
50R
ONLY
SEC.
DBL PL
2107313-43

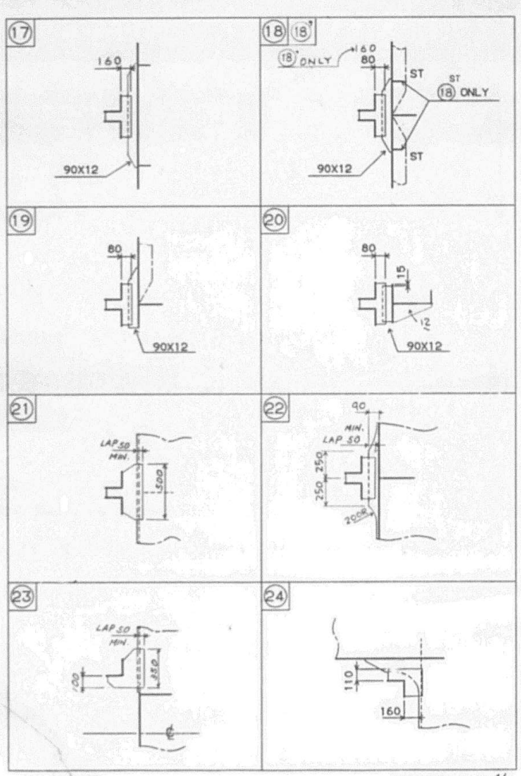
DETAIL OF CELL GUIDE RIB



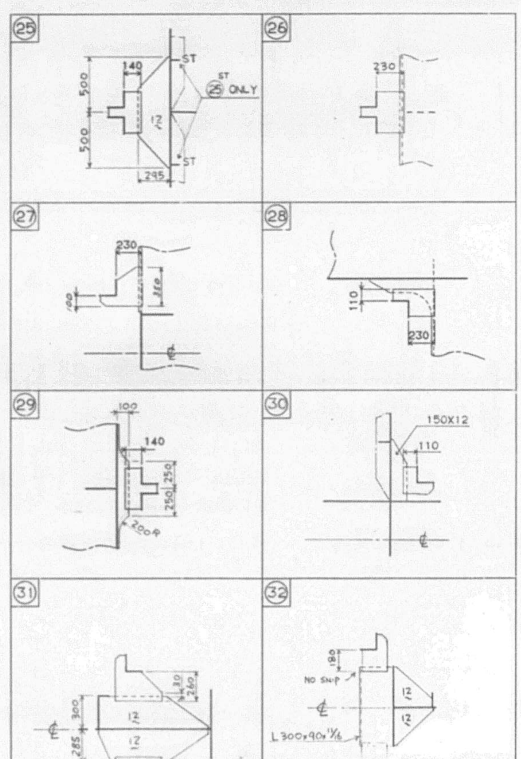
2107313 -44/



2107313 -45/



2107313 -46/



2107313 -47/47

PLAN RECORD BY MHI

ALT. NO.	MARK	DESCRIPTION	DATE	BY
ORIG.	—	FOLLOWED MES ORIGINAL PLAN	APR. 23, '85	
-10	A	SUBMITTED FOR APPROVAL OF OWNER & ABS PREPARED TO MODIFICATION FOR MHI BUILDING SHIPS. 1. REARRANGED BLOCK BUTT JOINTS ON CENTER LINE LONGITUDINAL BOX GIRDER. 2. DELETED BLOCK BUTT JOINTS ON CENTER LINE LONGITUDINAL BOX GIRDER. 3. SHIFTED BLOCK BUTT JOINTS ON HORIZONTAL GIRDER & TRANS WEB OF CONTAINER SUPPORT CONSTRUCTION IN WAY OF LONGL BULKHEAD. 4. ADDED BLOCK BUTT JOINTS ON TRANS BOX GIRDER OF CONTAINER SUPPORT CONSTRUCTION IN WAY OF C.L. LONGL BOX GIRDER. 5. DELETED BUTT JOINTS ON CELL GUIDE. 6. ADDED BUTT JOINTS ON CELL GUIDE. BASED DWG: MES DWG NO. 2107313 (INCL. PARTLY REVISED PLAN NO. 1)	JUL. 1, '85	
-11		FOLLOWED MES PARTLY REVISED PLAN NO. 2	JUL. 22, '85	
-12	B	1. ADDED BLOCK BUTT JOINTS ON C.L. SEC. (P.SIDE). 2. PENETRATED C.L. VERT. WEB (P.SIDE) AT HORIZONTAL GIRDER IN SEC. Ⓓ & SEC. Ⓗ. 3. ADDED INSERT PLATES IN SEC. FR.142 & FR.178. 4. ADDED DRAIN HOLES IN SEC. Ⓑ. 5. DELETED ADJUSTING PIECE OF LOWER END OF CELL GUIDE. 6. MODIFIED SHAPE OF CELL GUIDE RIBS. FOLLOWED MES PARTLY REVISED PLAN NO. 3	AUG. 9, '85	
-13	C	DELETED BLOCK BUTT JOINTS ON C.L. SEC. (P.SIDE)	OCT. 31, '85	

5 SHEETS WITH COVER

CONFERRED	SHIP DESIGNING DEPARTMENT HULL DESIGNING SECTION	
	APPROVED S. Hirayama / H. Tokawa	CLASS ABS
	CHECKED S. Furuhashi	コンテナー支持構造(ネ3.4倉) CONT. SUPPORT CONST.(NO.3&4H)
	DRAWN	
	SCALE	
	ORDER 01-15800 ~~01-15900~~ ~~01-16400~~	DRAWING NO. HS-19430-F / LYKES REF. NO. 120505

MITSUBISHI HEAVY INDUSTRIES, LTD.
KOBE SHIPYARD & ENGINE WORKS

PLAN RECORD BY MHI (CONTINUE)

ALT. NO.	MARK	DISCRIPTION	DATE	BY
—	—	DELETED MHI PARTLY REVISED PLAN NO. -13 REFER TO MHI TLX NO. LL-126 DATED NOV. 25 '85.	NOV. 25 '85	
-14	D	ADDED TEMP. ACCESS HOLES ON FR. 142 & 178 SEC.	JAN. 20, '86	
-F		PREPARED AS FINISHED PLAN FOR S. NO. 1158	MAR. 11, '86	

APPROVAL OF OWNER & REGULATORY BODIES

ALT. NO.	OWNER DATE	OWNER LETTER NO.	USCG DATE	USCG LETTER NO.	ABS DATE	ABS LETTER NO.	USPH DATE	USPH LETTER NO.
ORIGINAL	24 MAY '85	MTS/MES-493						
PART. REV PLAN NO. 1	11 JUL '85	MTS/MES-906						
PART. REV PLAN NO. 2	23 JUL '85	TOM/24						

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SHIPYARD AND SHIP'S NO. & NAME

~~MITSUI TAMANO~~		MITSUBISHI KOBE	
NO. 1323	~~DOCTOR LYKES~~	NO. 1158	JAMES LYKES
NO. 1324	~~ALMERIA LYKES~~	NO. 1159	~~JOSEPH LYKES~~
NO. 1325	~~TILLIE LYKES~~	NO. 1164	~~SOLON TURMAN~~

MITSUI ENGINEERING & SHIPBUILDING CO., LTD.
TAMANO WORKS

SHIP DESIGN DEPARTMENT MANAGER — SHIP'S NO. — SHIP'S NAME

STRUCTURE DESIGN SEC.
SEC. CHIEF N. Yamamoto
ASSISTANT CHIEF
CHARGE ENG'R
STAFF TE H.Y.

PARTLY REVISED PLAN NO. 3

コンテナー支持構造(ネ3.4倉)
CONT. SUPPORT CONST.(NO.3&4H)

DATE	SCALE	LYKES REF. NO.	MITSUI DRAWING NO.
(TEL. 3227) JOB NO. TS1323/24/25 JOBCLASSIF. NO. B-07	1/100	120505	2107313-3

(3 SHEETS WITH COVER)

PLAN RECORD

ALT. NO.	MARK	ALTERATION/DESCRIPTION	DATE & SIGNATURE
ORIGINAL		Prepared for approval of owner and ABS.	MAR. 27. '85
1	1	MISCELLANEOUS RIVESION (DESIGN DEVELOPMENT) DESIGN DEVELOPMENT & OWNERS COMMENT	JUN. 10 '85 J.M
2	2	MISCELLANEOUS RIVESION (DESIGN DEVELOPMENT)	JUL. 9 '85 H.Y
3	3	MISCELLANEOUS RIVESION (DESIGN DEVELOPMENT)	JUL. 29 '85 H.Y

DWG. NO. 2107313 -1/

613

MATERIAL LIST

NOTES:-

1. BOTH SIDES TO BE SYMMETRICAL EXCEPT SPECIFIED.
2. TRANS. SECTIONS TO BE "LOOKING FORE" EXCEPT SPECIFIED.
3. REFER TO "CONSTRUCTION DETAILS (DWG NO. 2100811)" FOR STRUCTURAL DETAILS OF MEMBERS, ETC. EXCEPT SPECIFIED.
4. REFER TO "WELDING TABLE (DWG NO. 2100832)" FOR LEG LENGTH OF WELDING EXCEPT SPECIFIED.

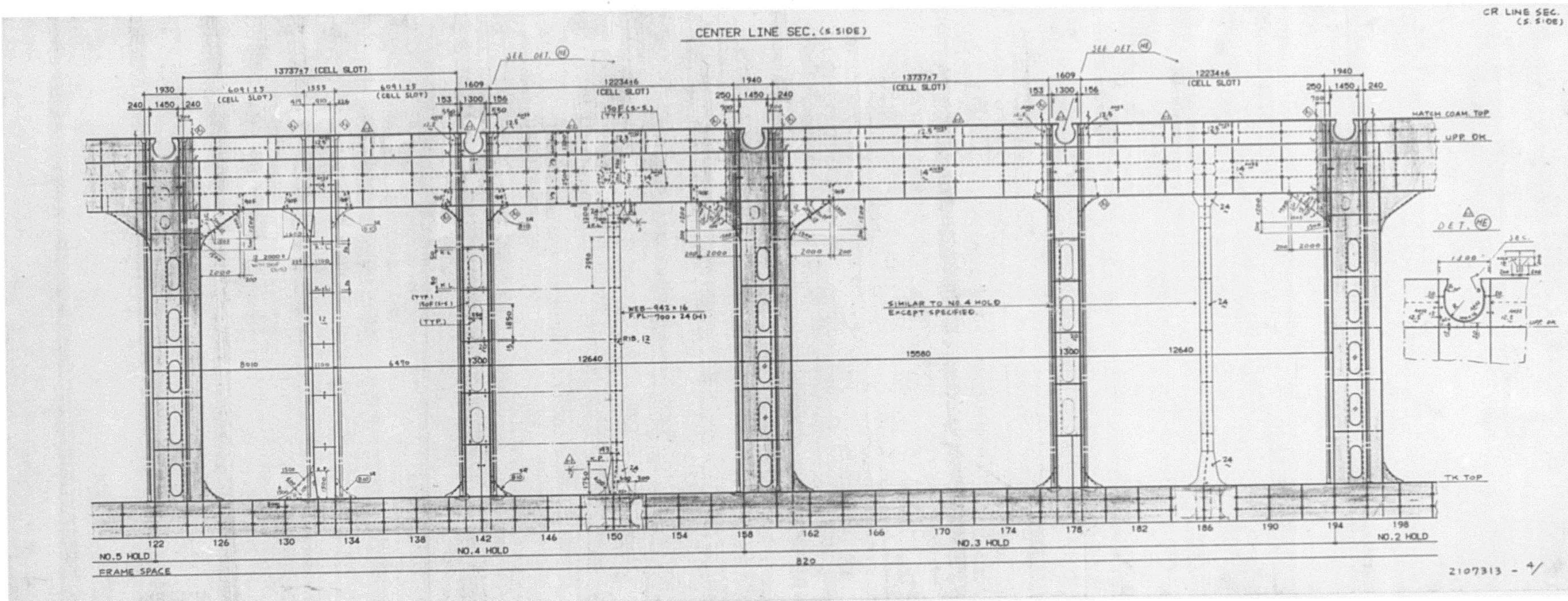
	ITEM	MATERIAL	NO. (SET)	
①	ENTRY GUIDE	(STEEL CASTING) SC42 (MAX CARBON 0.20%)	16	
②	〃	〃	16	
③	〃	〃	32	
④	〃	〃	8	
⑤	〃	〃	8	

備 考:-

1. 特記の他は，両舷対称とする。
2. 横断面図は，特記の他は後面を示す。
3. 構造詳細については，特記の他は
   '構造詳細図（図番2100811）'を参照のこと。
4. 溶接脚長については，特記の他は
   '溶接脚長表（図番2100832）'を参照のこと。

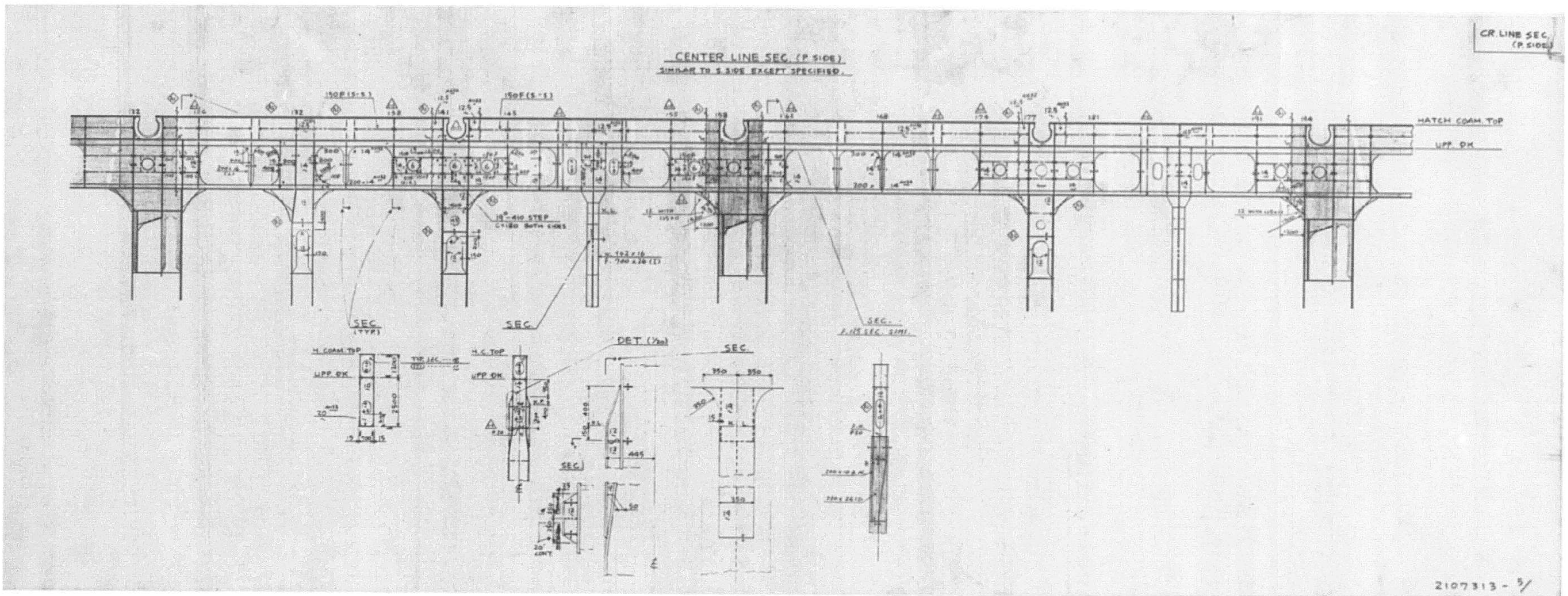
2107313-2/
2107313-3/

614



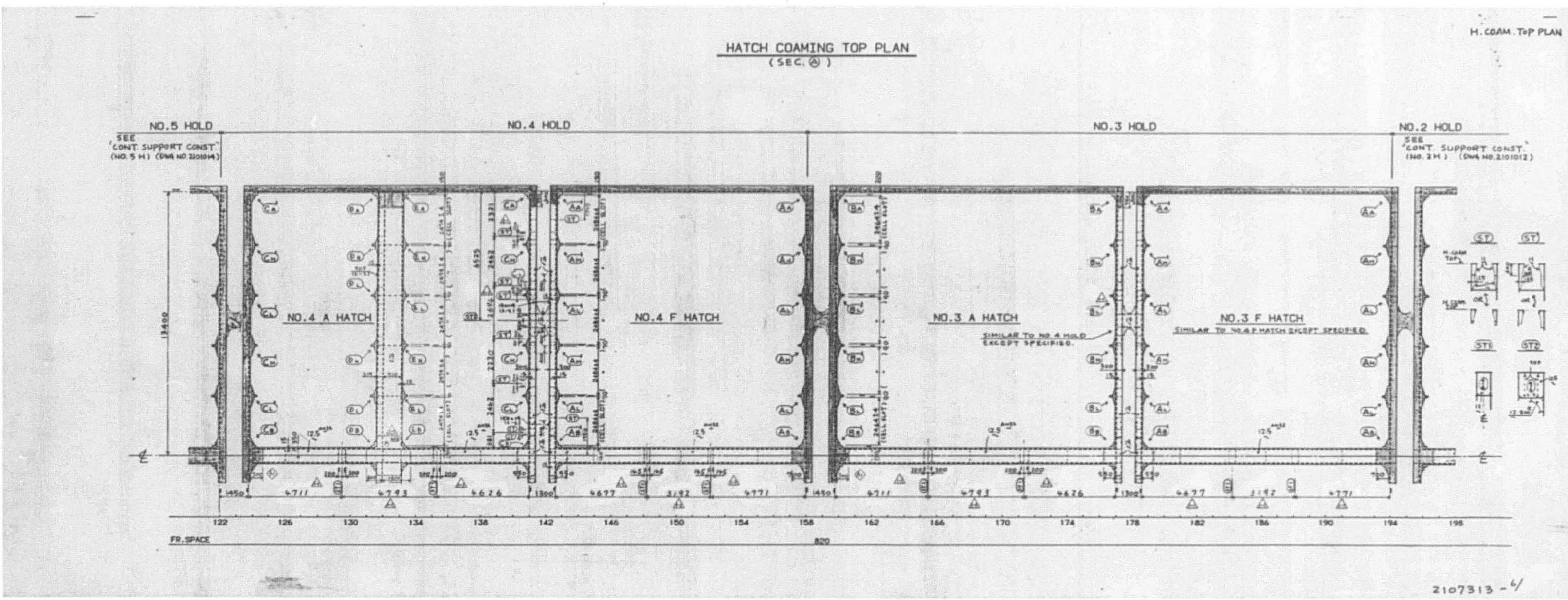
CENTER LINE SEC. (S. SIDE)
CR LINE SEC. (S. SIDE)
HATCH COAM. TOP
UPP DK
SIMILAR TO NO.4 HOLD EXCEPT SPECIFIED
TK TOP
NO.5 HOLD
NO.4 HOLD
NO.3 HOLD
NO.2 HOLD
FRAME SPACE
820
2107313 - 4/

615



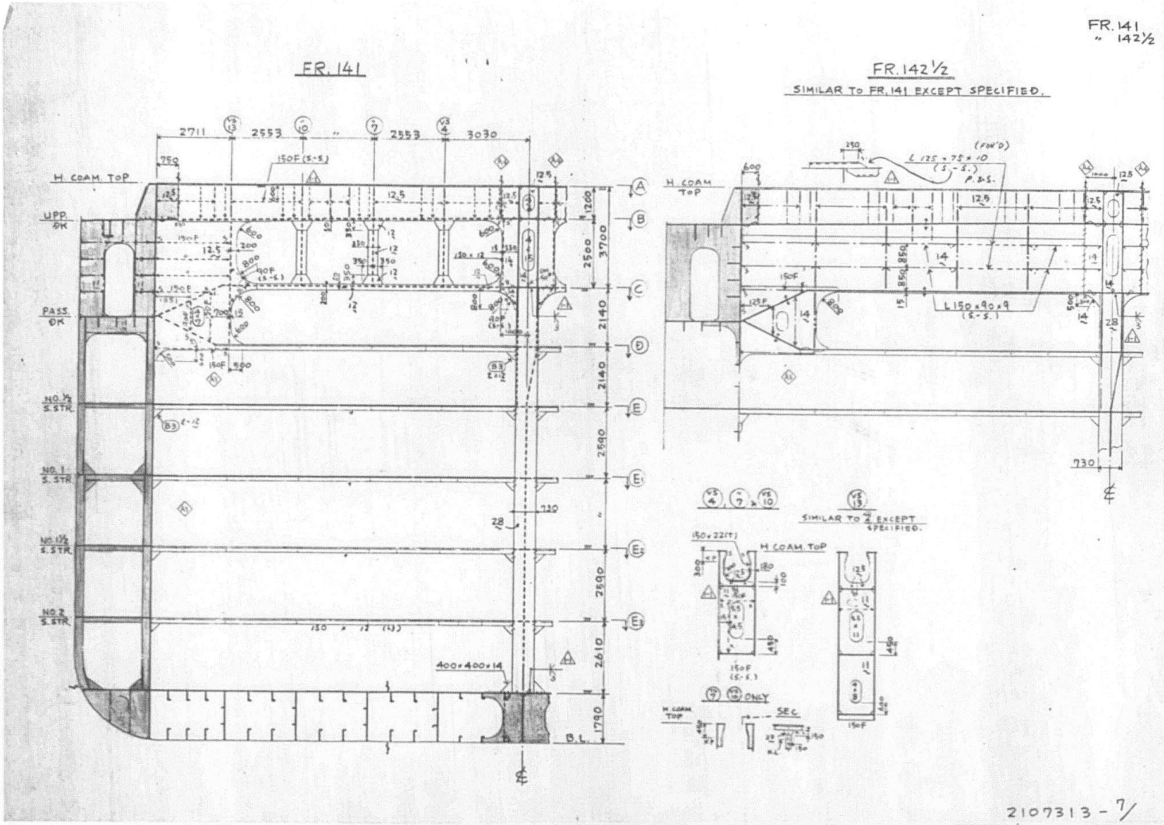
2107313 - 5/

616

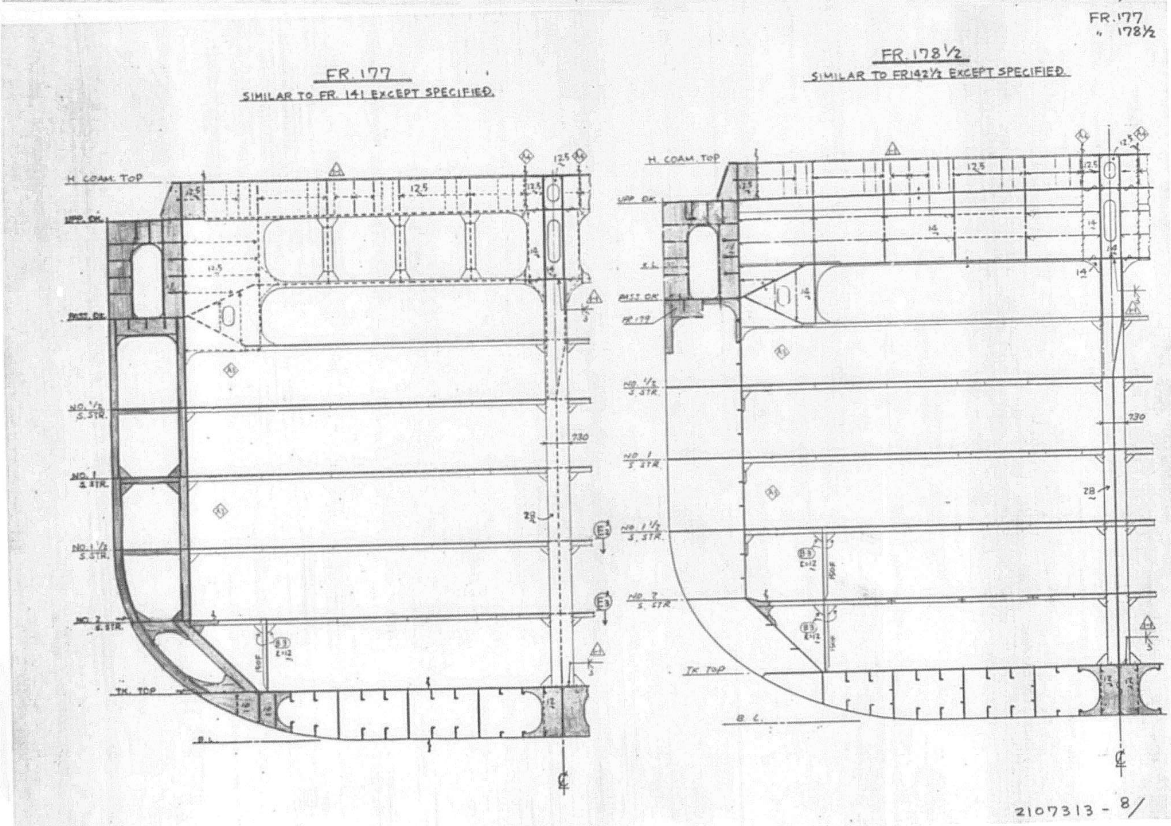


HATCH COAMING TOP PLAN
(SEC. A)
H. COAM. TOP PLAN
NO.5 HOLD
NO.4 HOLD
NO.3 HOLD
NO.2 HOLD
NO.4 A HATCH
NO.4 F HATCH
NO.3 A HATCH
NO.3 F HATCH
FR. SPACE
2107313-4

617



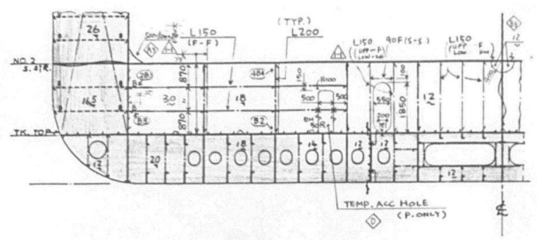
FR. 141
" 142½
FR. 141
FR. 142½
SIMILAR TO FR. 141 EXCEPT SPECIFIED.
H. COAM. TOP
UPP. DK
PASS. DK
NO. ½ S. STR.
NO. 1 S. STR.
NO. 1½ S. STR.
NO. 2 S. STR.
B. L.
SIMILAR TO 7 EXCEPT SPECIFIED.
2107313 - 7/



FR. 177
" 178½
FR. 177
SIMILAR TO FR. 141 EXCEPT SPECIFIED.
FR. 178½
SIMILAR TO FR. 142½ EXCEPT SPECIFIED.
H. COAM. TOP
TK. TOP
B. L.
2107313 - 8/

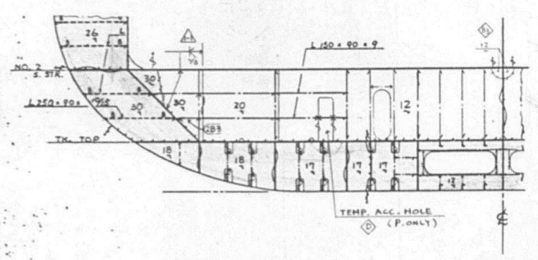
618

FR. 142



FR. 178

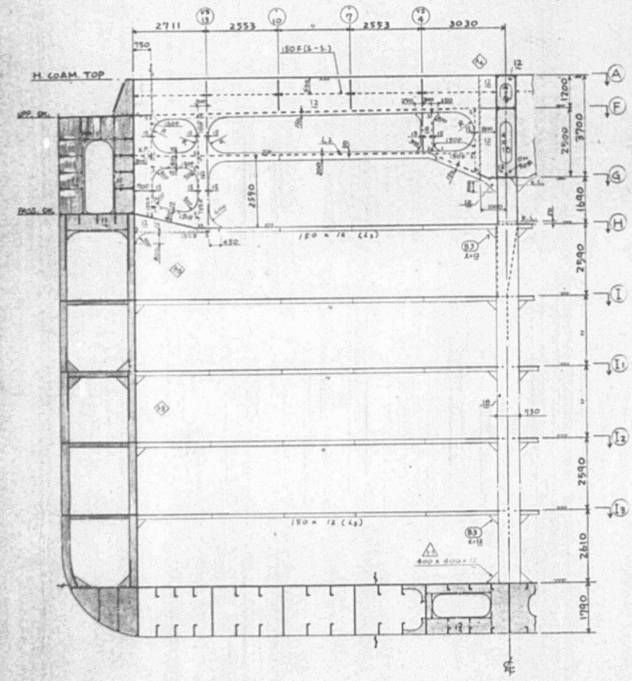
SIMILAR TO FR 142 EXCEPT SPECIFIED



2107313 - 9/

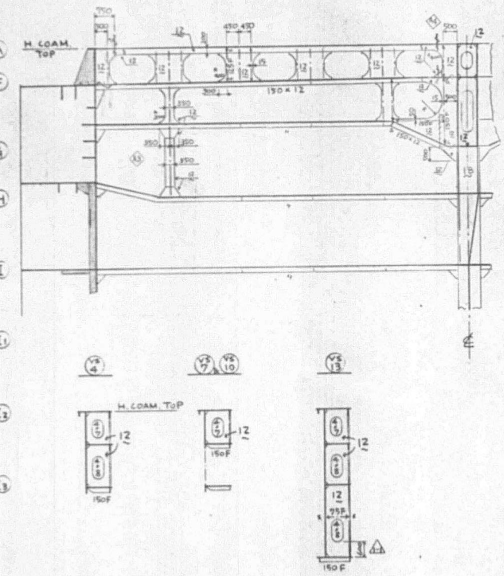
FR. 132
" 133½

FR. 132

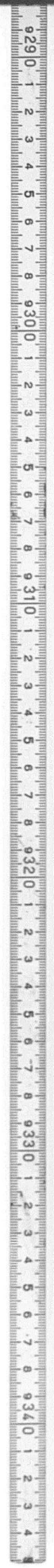


FR. 133½

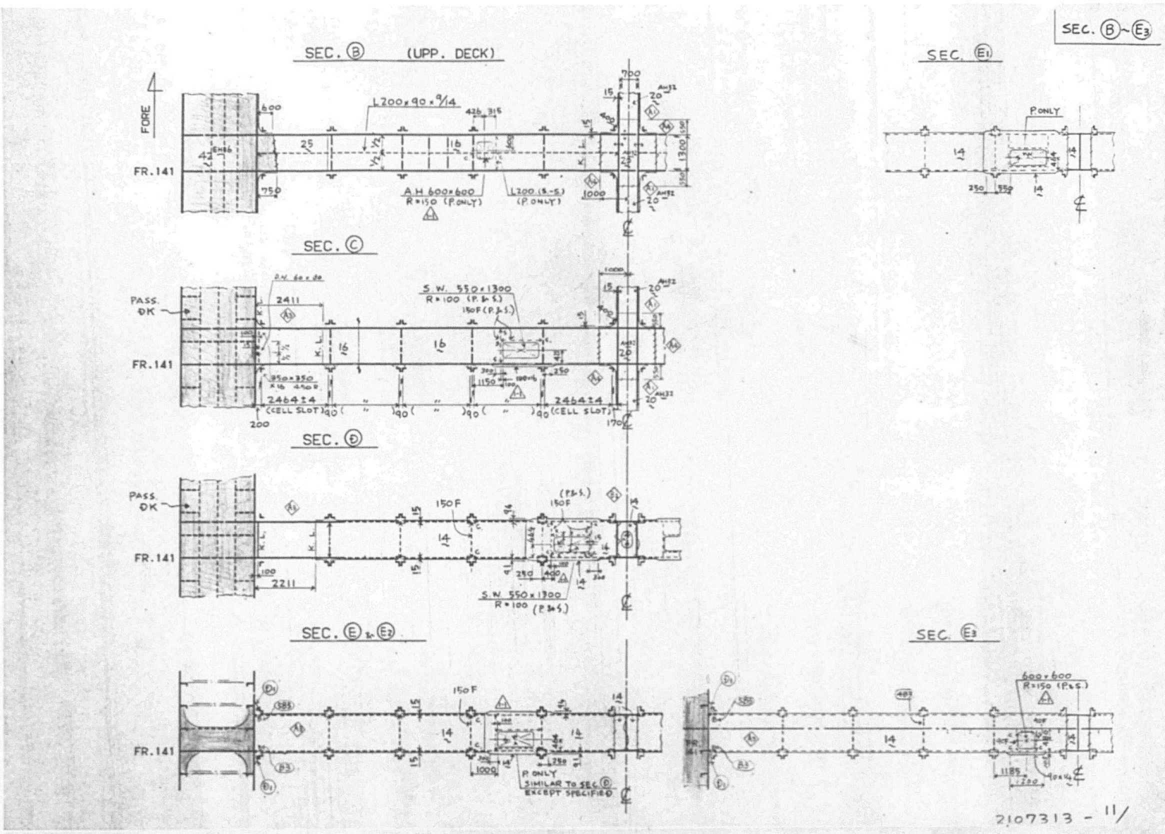
SIMILAR TO FR 132 EXCEPT SPECIFIED.

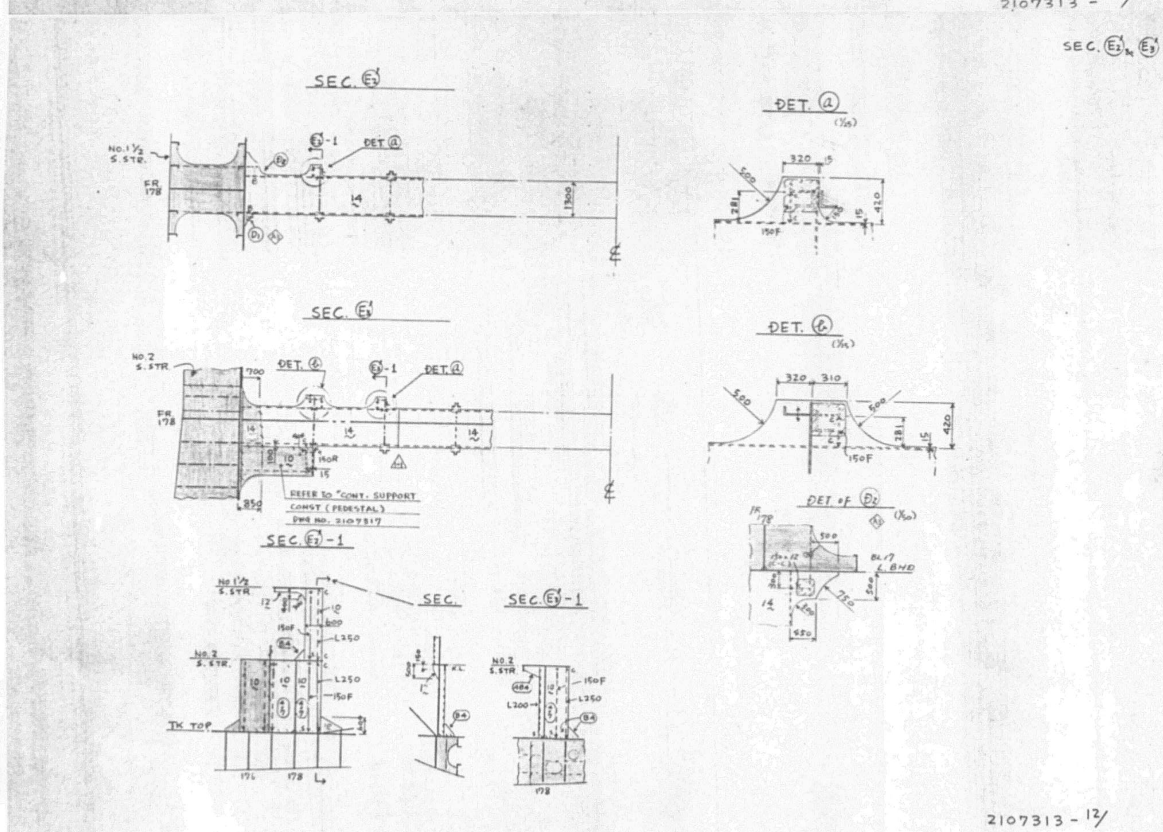


2107313 - 10/

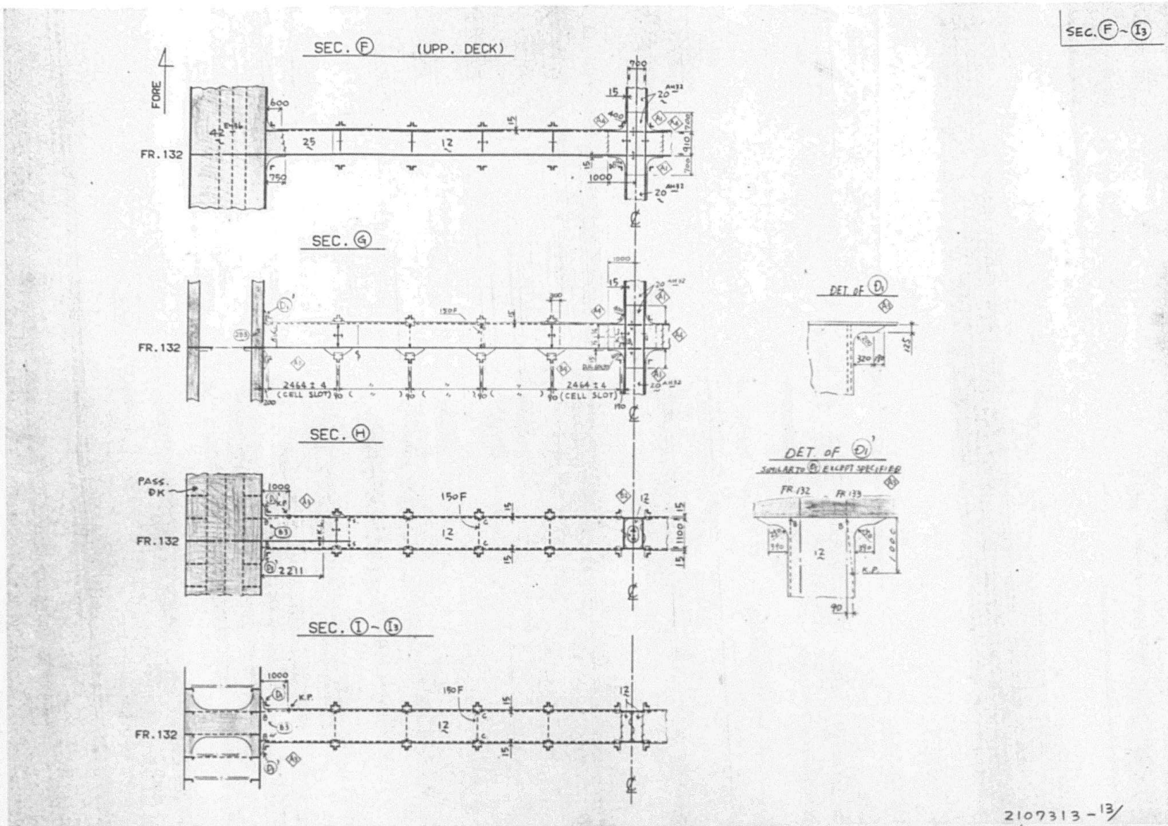


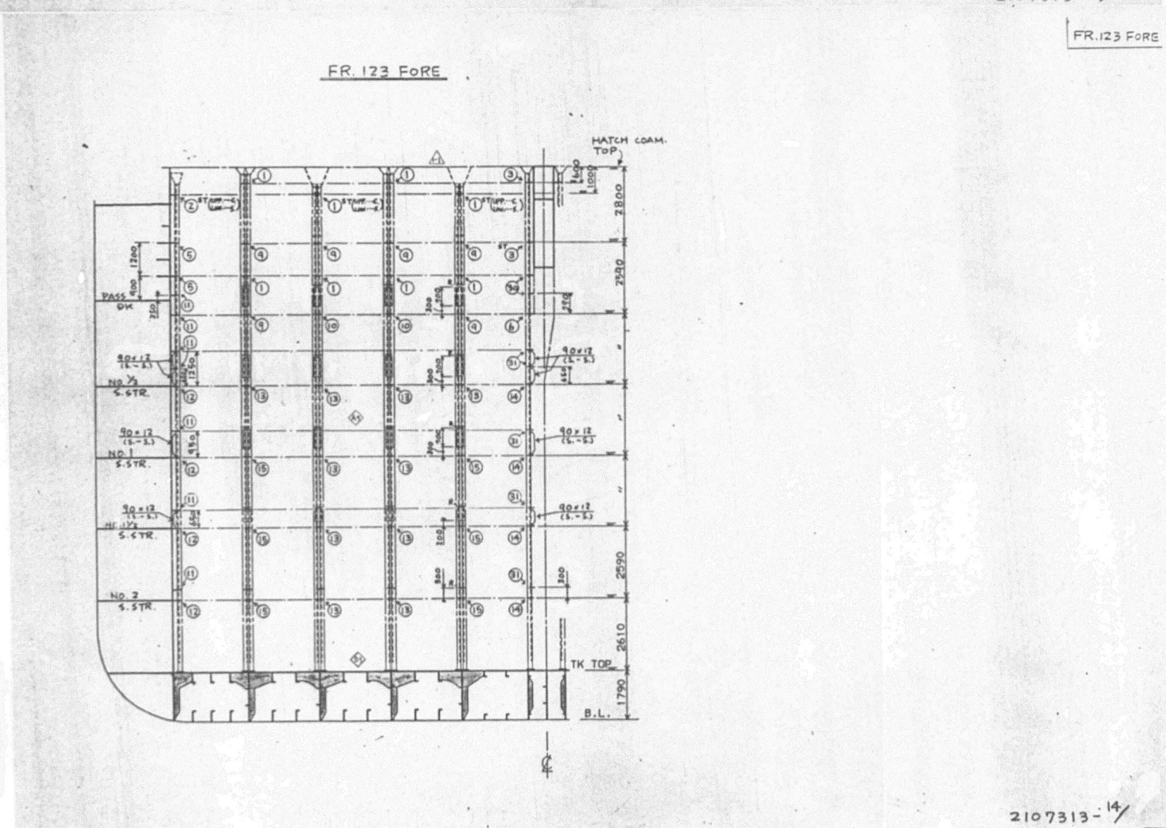
619


SEC. B~E3
SEC. B (UPP. DECK)
FORE
FR.141
SEC. E1
P ONLY
SEC. C
PASS. DK
SEC. D
SEC. E & E2
SEC. E3
P ONLY
SIMILAR TO SEC D
EXCEPT SPECIFIED
2107313 - 11/


SEC. E2' & E3'
SEC. E2'
DET. a
SEC. E3'
DET. b
DET OF D2
REFER TO "CONT. SUPPORT
CONST (PEDESTAL)
DWG NO. 2107317
SEC. E2'-1
SEC.
SEC. E3'-1
TK TOP
2107313 - 12/

620

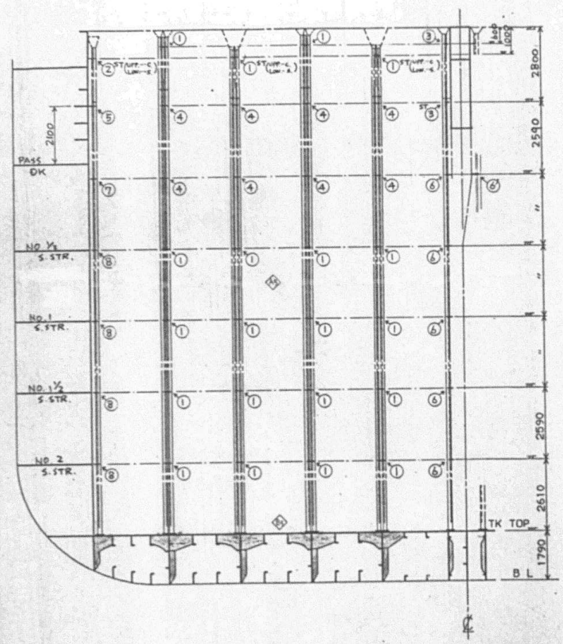

SEC. (F) ~ (I3)
SEC. (F) (UPP. DECK)
FORE
FR. 132
SEC. (G)
(CELL SLOT)
SEC. (H)
PASS. DK
SEC. (I) ~ (I3)
DET. OF (D1)
DET. OF (D1)'
2107313 - 13/


FR. 123 FORE
HATCH COAM. TOP
PASS. DK
NO. 1/2 S. STR.
NO. 1 S. STR.
NO. 2 S. STR.
TK TOP
B.L.
2107313 - 14/

621

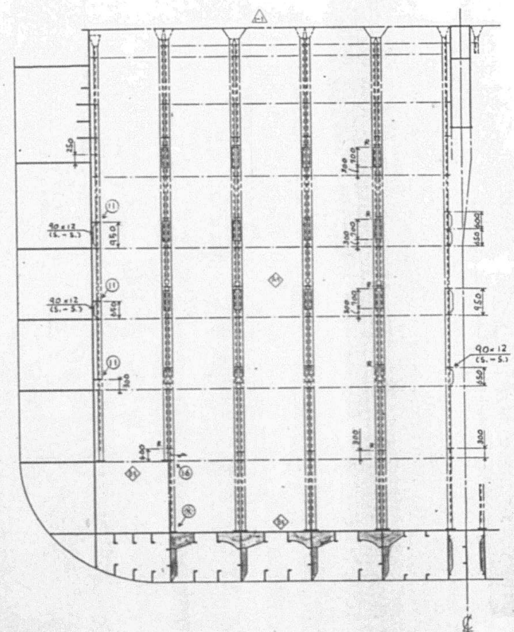
FR. 158 AFT
" 159 FORE

FR. 158 AFT



FR. 159 FORE

SIMILAR TO FR. 123 FORE EXCEPT SPECIFIED.

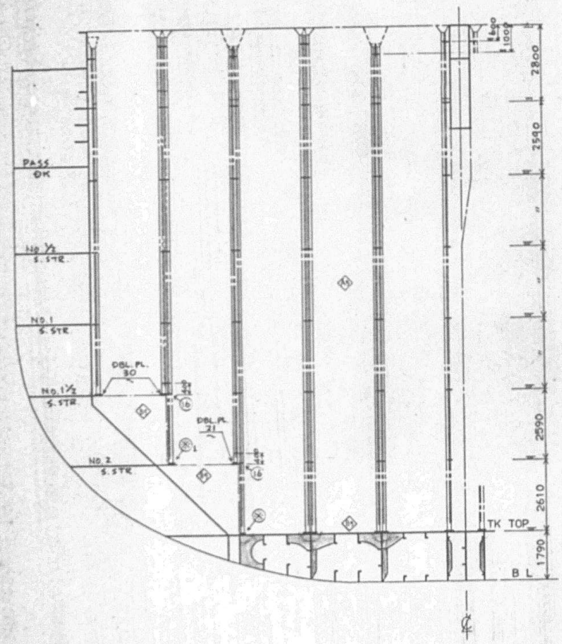


2107313 - 15/

FR. 194 AFT

FR. 194 AFT

SIMILAR TO FR. 158 AFT EXCEPT SPECIFIED.

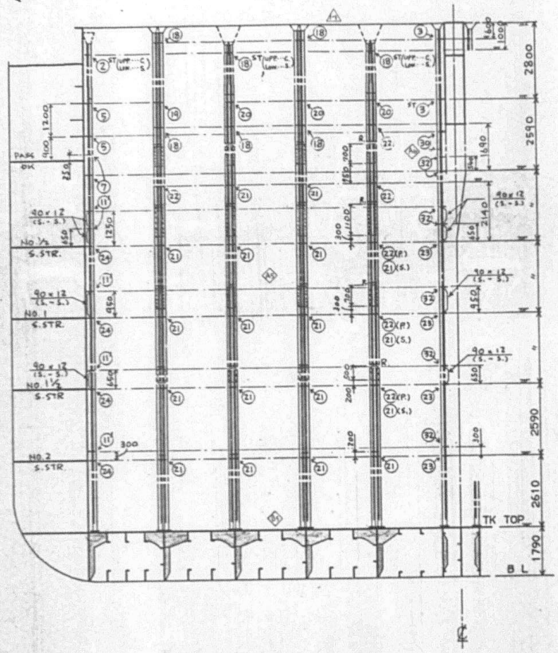


2107313 - 16/

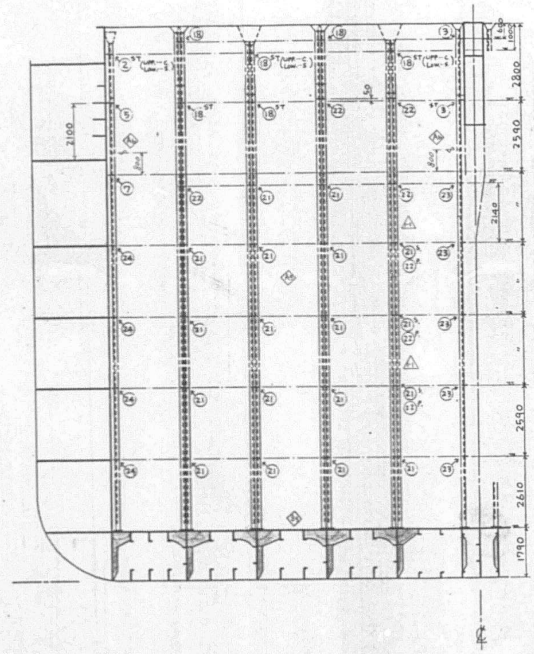
622

FR. 141 AFT
" 142 FORE

FR. 141 AFT



FR. 142 FORE

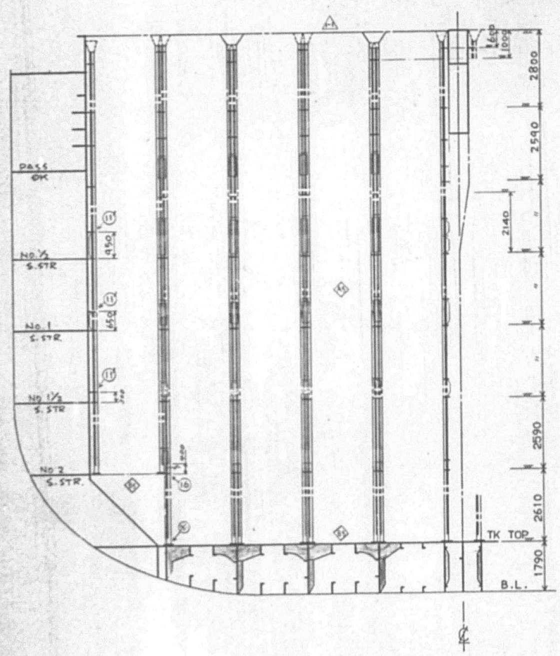


2107313 - 17/

FR. 177 AFT
" 178 FORE

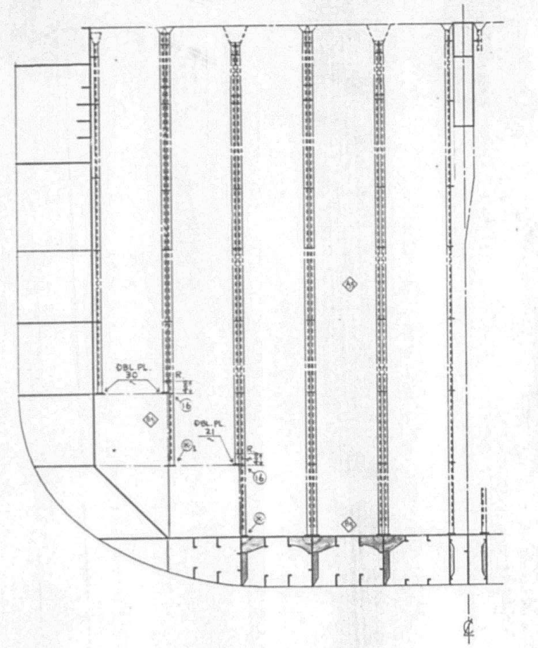
FR. 177 AFT

SIMILAR TO FR. 141 AFT EXCEPT SPECIFIED



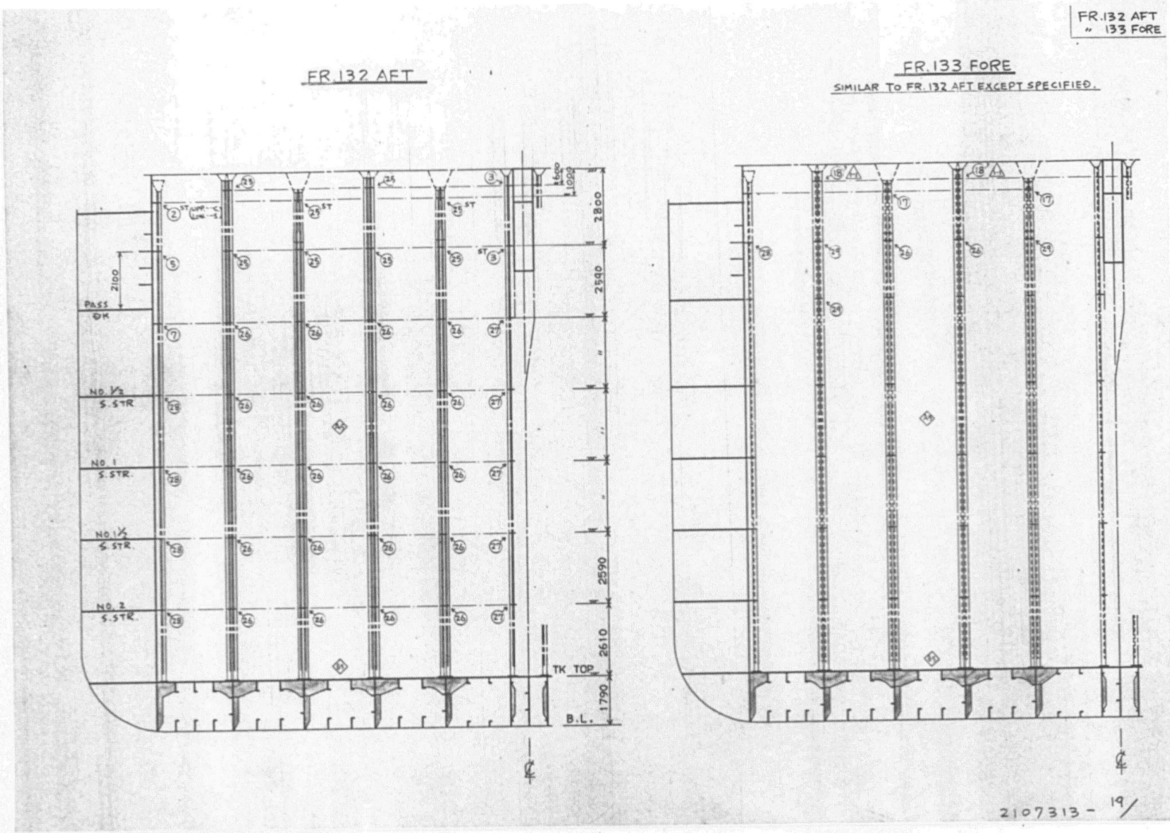
FR. 178 FORE

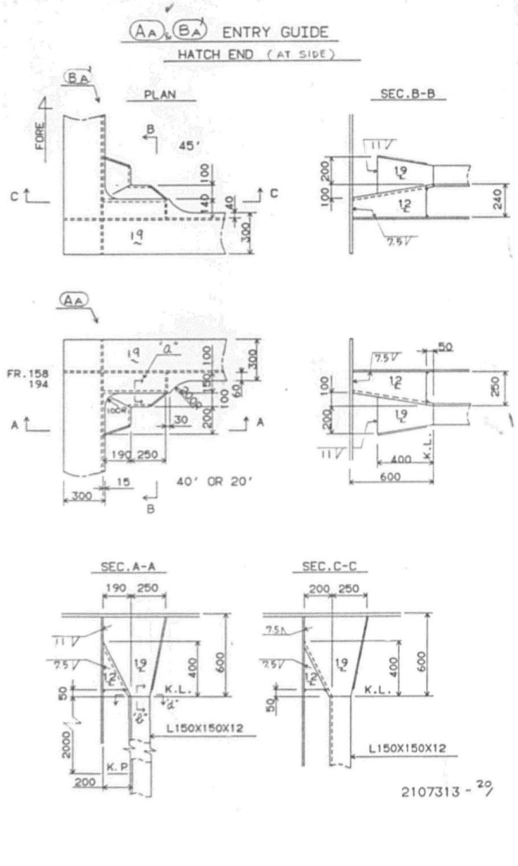
SIMILAR TO FR. 142 FORE EXCEPT SPECIFIED

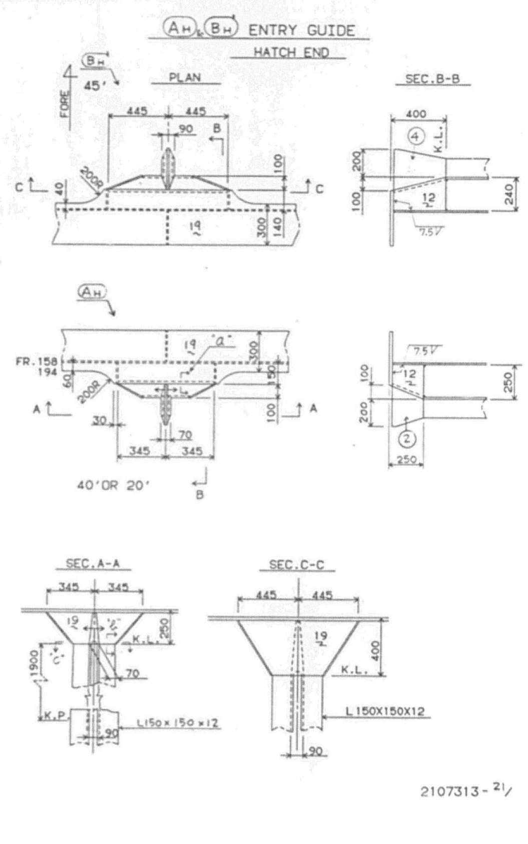


2107313 - 18/

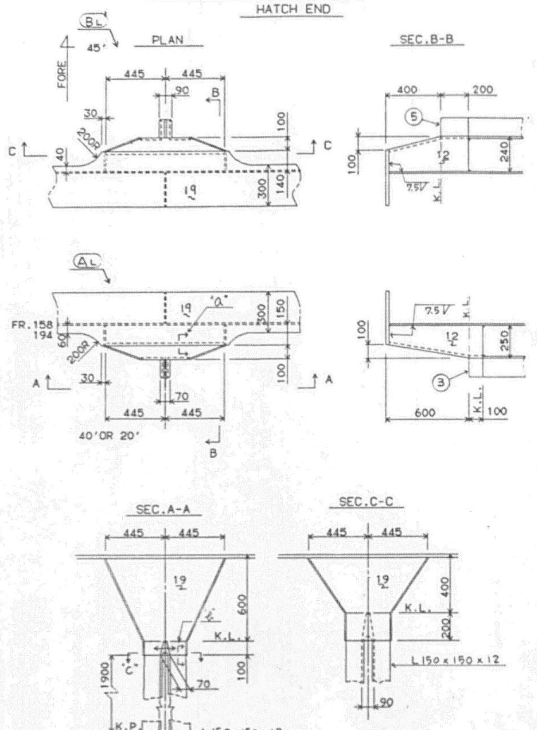
623


FR.132 AFT
" 133 FORE
FR.132 AFT
FR.133 FORE
SIMILAR TO FR.132 AFT EXCEPT SPECIFIED.
PASS DK
NO.1/2 S.STR.
NO.1 S.STR.
NO.1 1/2 S.STR.
NO.2 S.STR.
TK TOP
B.L.
2800
2590
2610
1790
2100
2107313 - 19/


(AA)&(BA) ENTRY GUIDE
HATCH END (AT SIDE)
PLAN
SEC.B-B
FORE
45'
FR.158
194
40' OR 20'
SEC.A-A
SEC.C-C
K.L.
K.P.
L150X150X12
2107313 - 20/

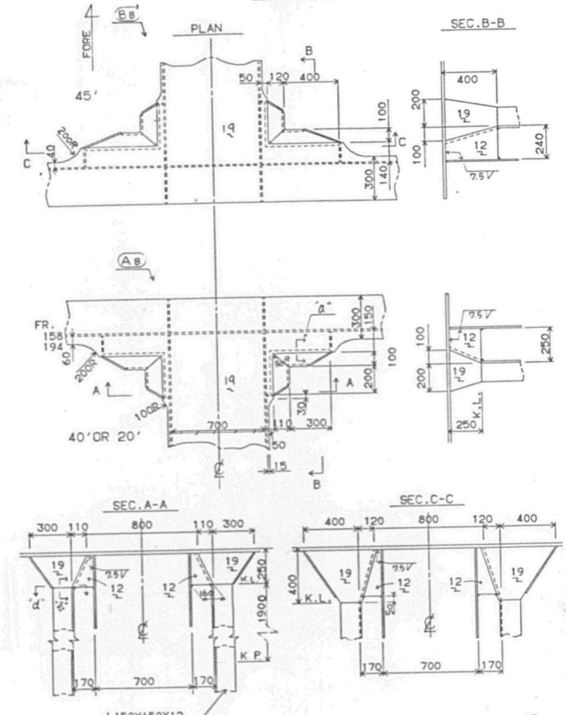

(AH)&(BH) ENTRY GUIDE
HATCH END
PLAN
SEC.B-B
FORE
45'
FR.158
194
40'OR 20'
SEC.A-A
SEC.C-C
K.L.
K.P.
L150×150×12
L150X150X12
2107313 - 21/

(A_L) & (B_L) ENTRY GUIDE
HATCH END



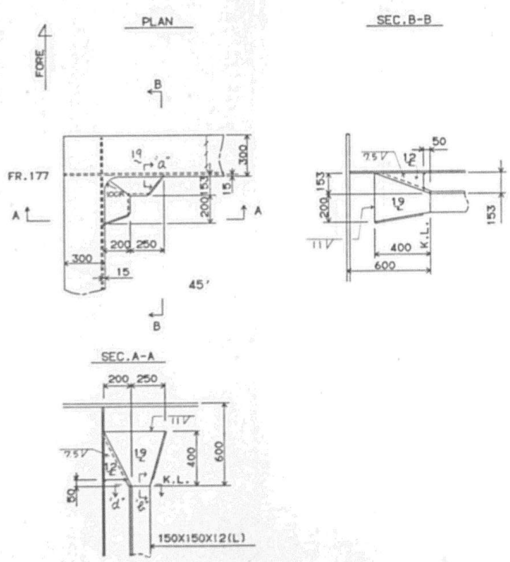
2107313-22

(A_B) & (B_B) ENTRY GUIDE
HATCH END



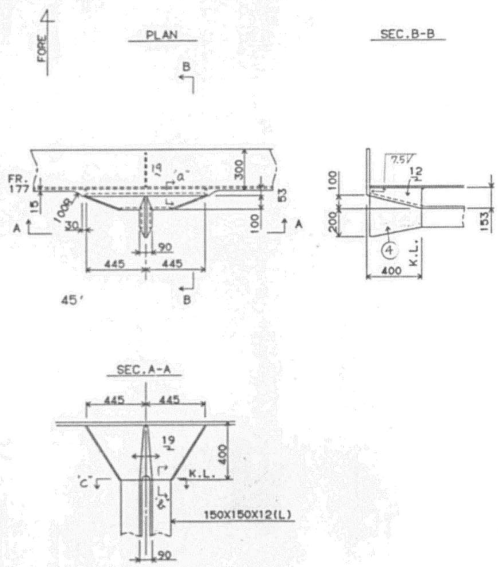
2107313-23

(B_A) ENTRY GUIDE
MID-HOLD (AT SIDE)



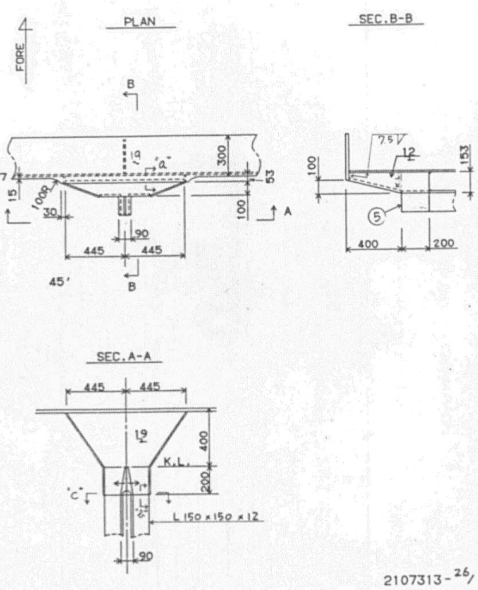
2107313-24

(B_H) ENTRY GUIDE
MID-HOLD



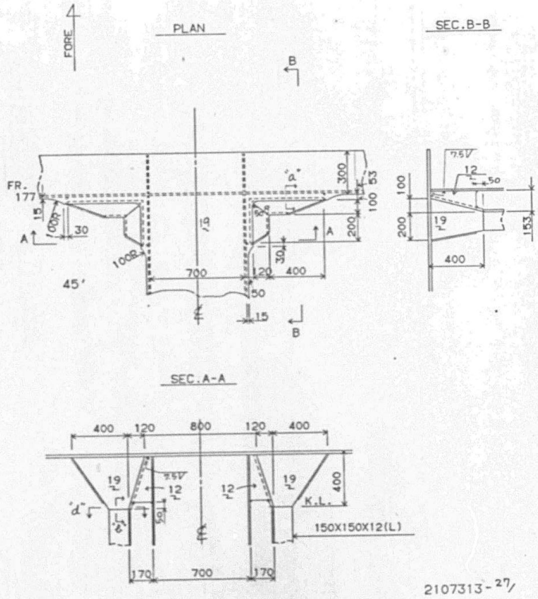
2107313-25

(BL) ENTRY GUIDE
MID-HOLD



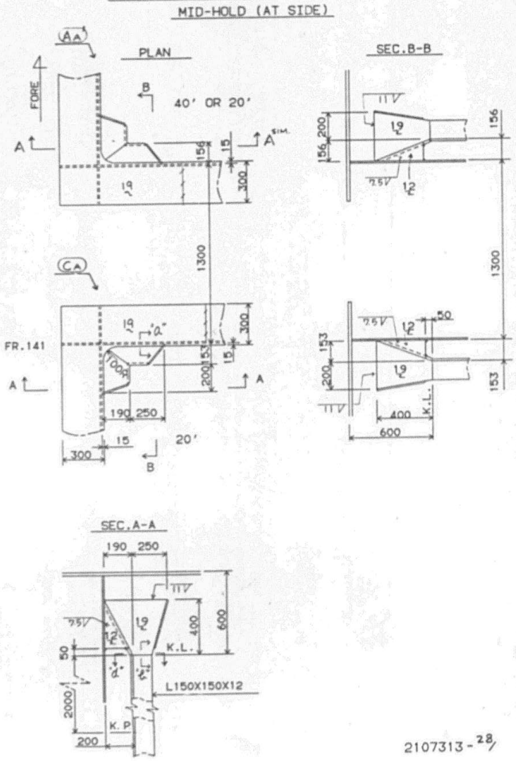
2107313-26

(BS) ENTRY GUIDE
MID-HOLD



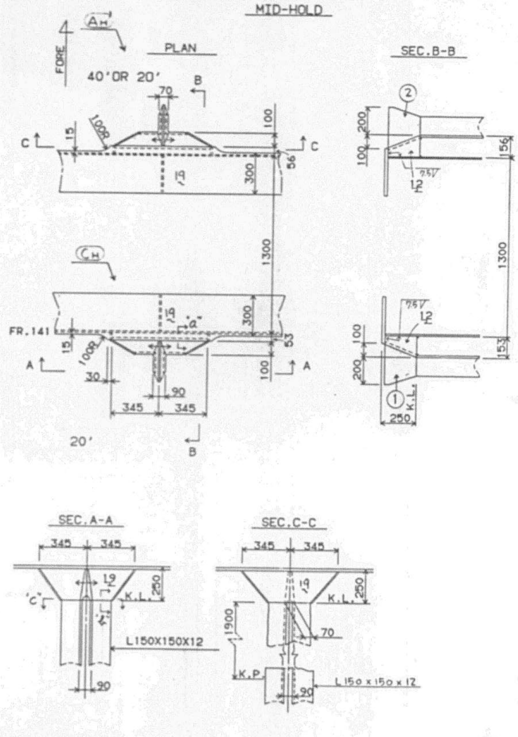
2107313-27

(CA), (AA) ENTRY GUIDE
MID-HOLD (AT SIDE)



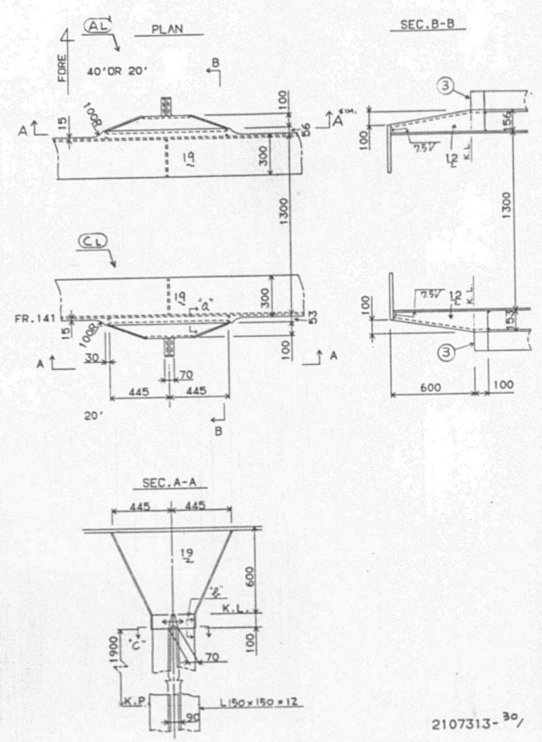
2107313-28

(CH), (AH) ENTRY GUIDE
MID-HOLD

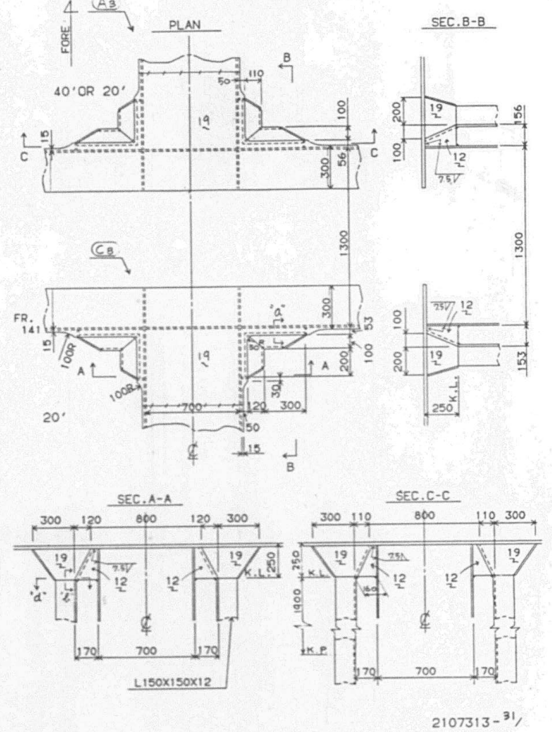


2107313-29

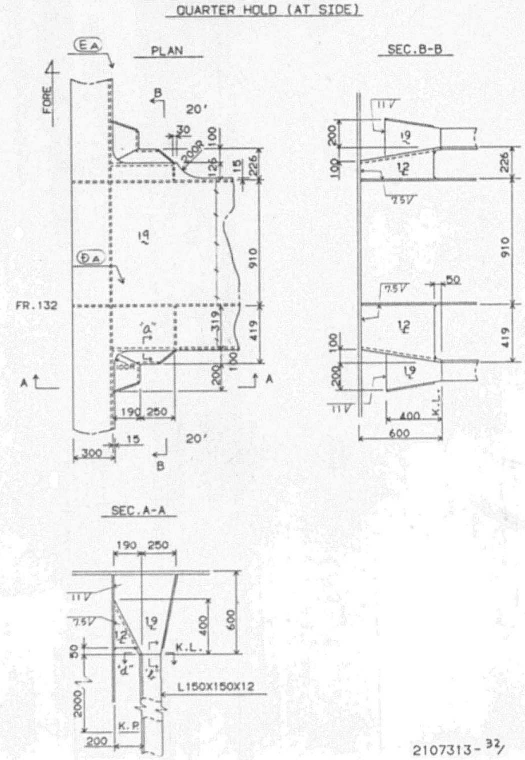
(CL),(AL) ENTRY GUIDE
MID-HOLD



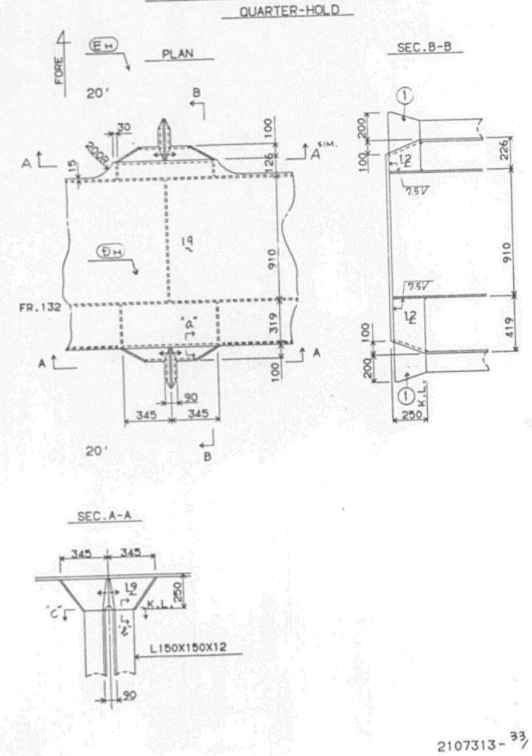
(CB),(AB) ENTRY GUIDE
MID-HOLD



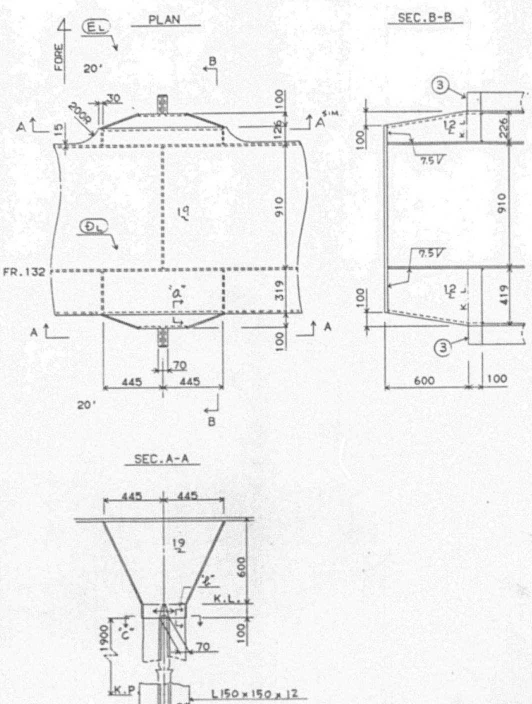
(DA),(EA) ENTRY GUIDE
QUARTER HOLD (AT SIDE)



(DH),(EH) ENTRY GUIDE
QUARTER-HOLD

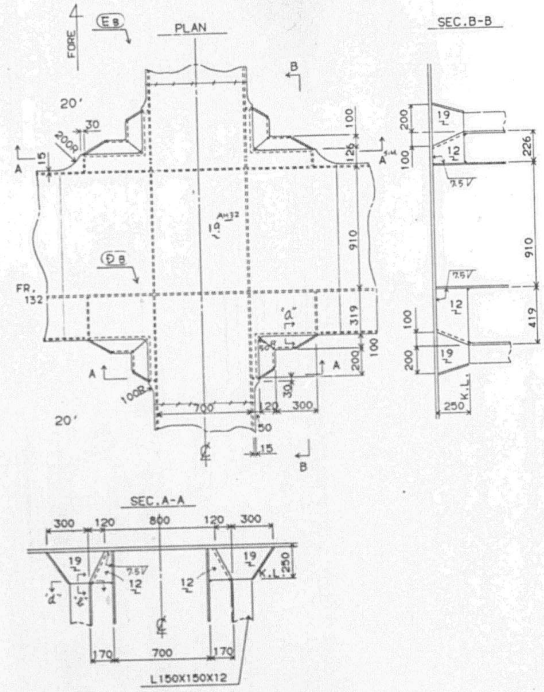


ⒹL, ⒺL ENTRY GUIDE
QUARTER-HOLD



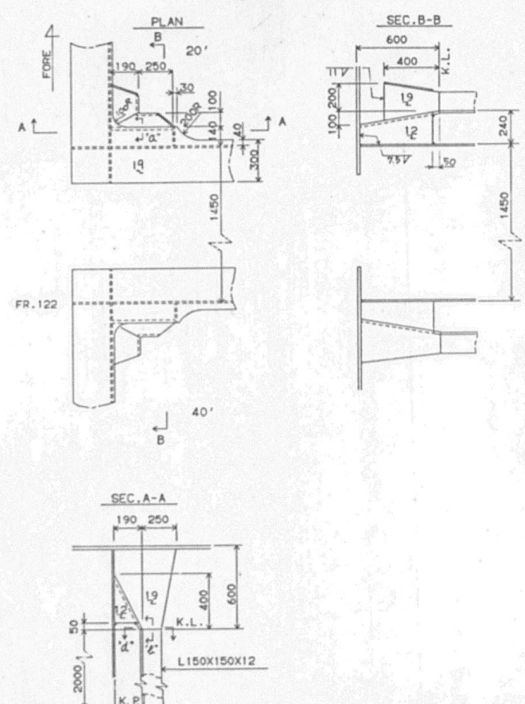
2107313-34/

ⒹB ⒺB ENTRY GUIDE
QUARTER HOLD



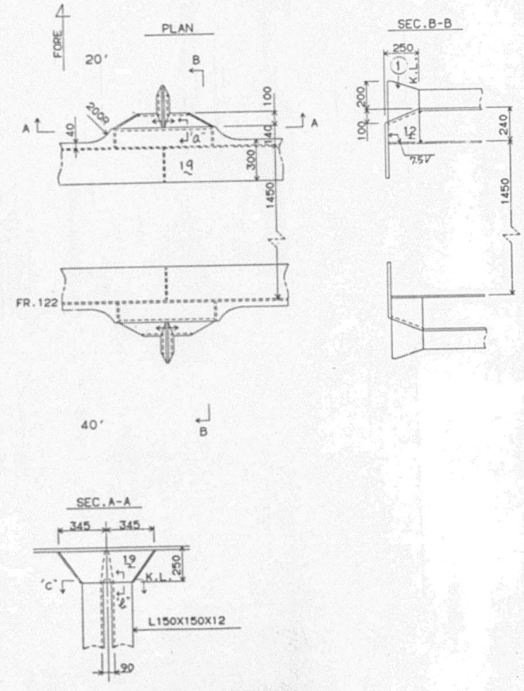
2107313-35/

ⒸA ENTRY GUIDE
HATCH END (AT SIDE)

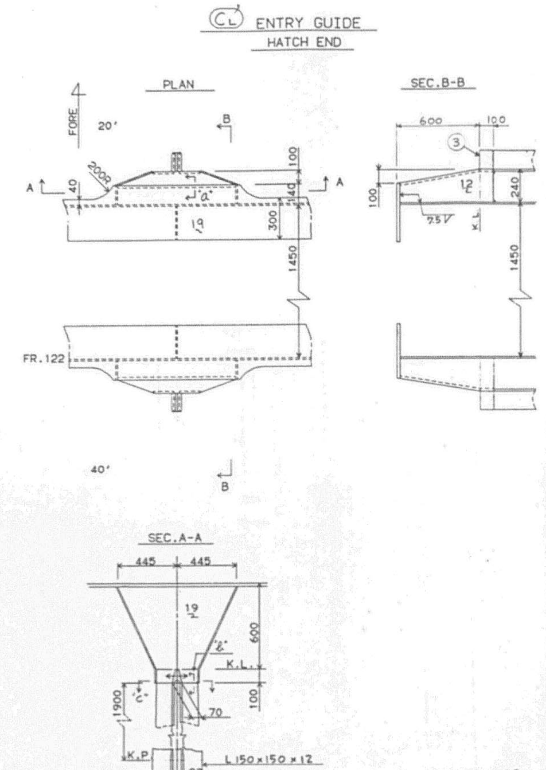


2107313-36/

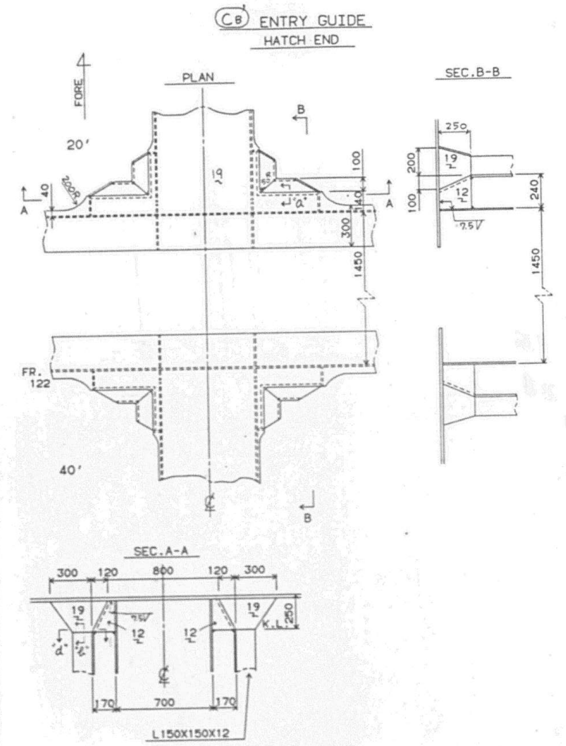
ⒸH ENTRY GUIDE
HATCH END



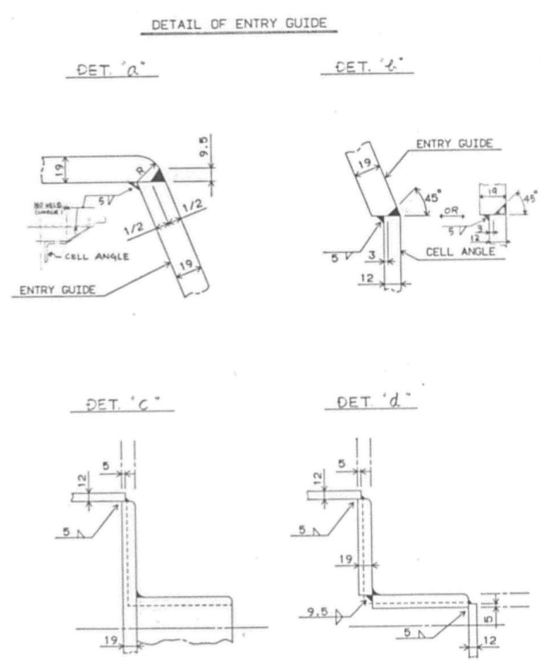
2107313-37/



2107313-38/

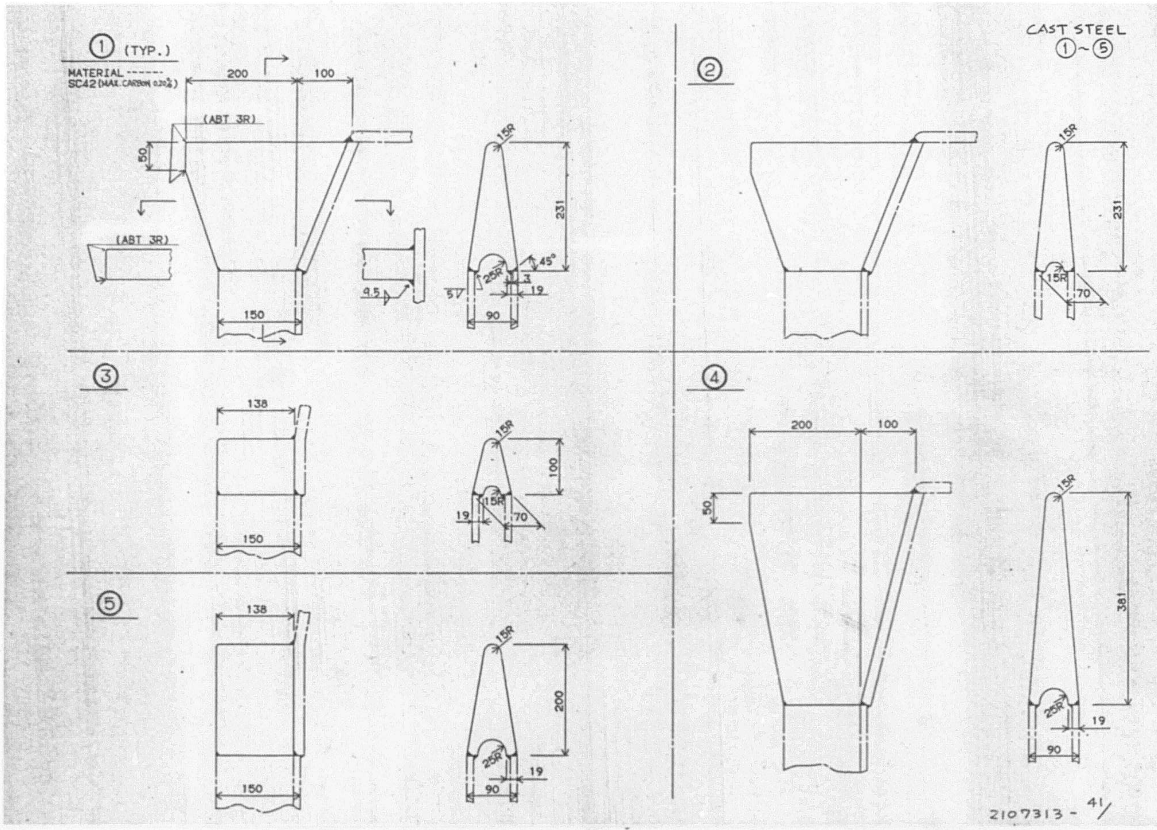


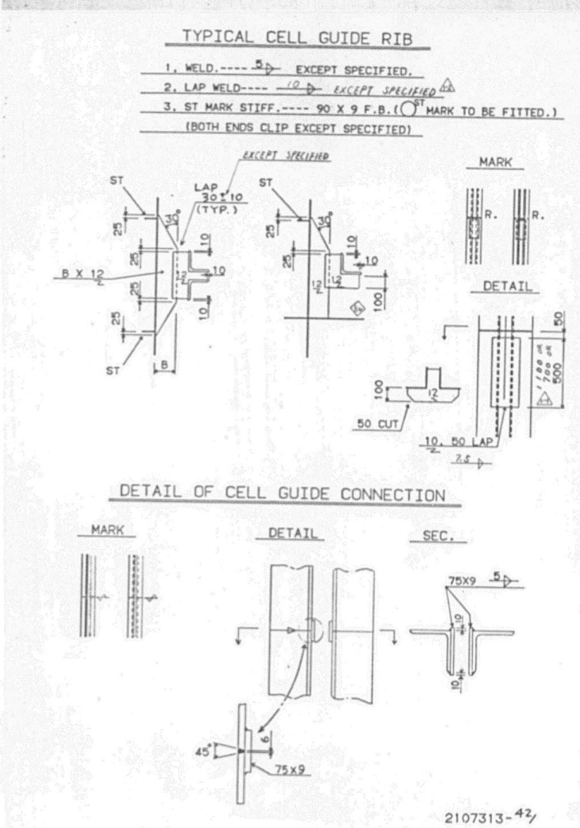
2107313-39/

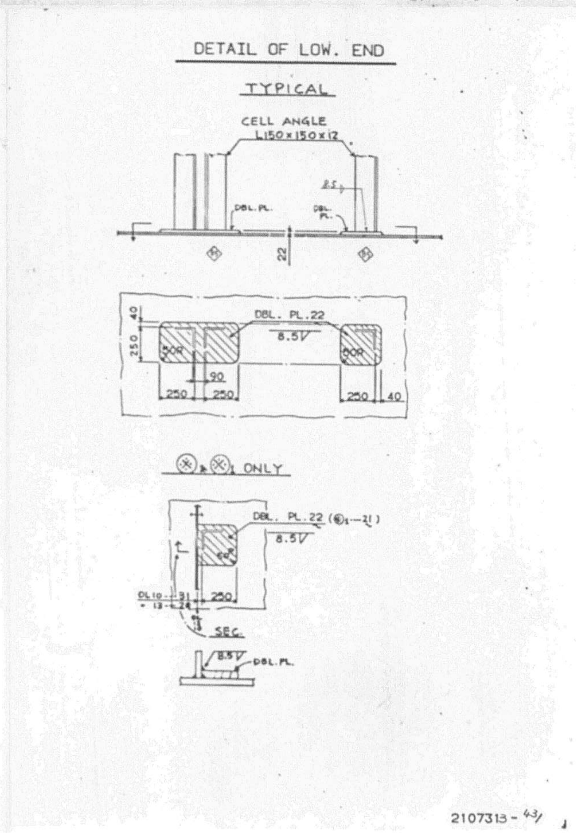


2107313-40/

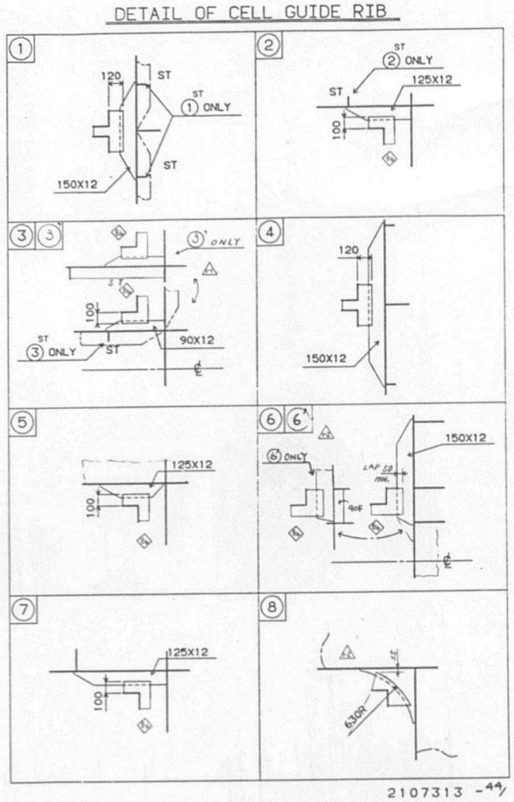
629


CAST STEEL ①~⑤
① (TYP.)
MATERIAL ------ SC42 (MAX. CARBON 0.30%)
(ABT 3R)
②
③
④
⑤
2107313-41/

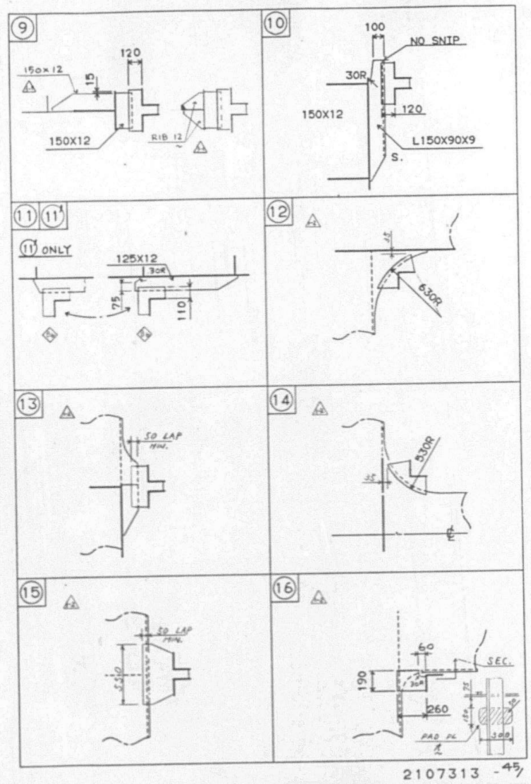

TYPICAL CELL GUIDE RIB
1. WELD ----- 5 EXCEPT SPECIFIED.
2. LAP WELD ---- 10 EXCEPT SPECIFIED
3. ST MARK STIFF. ---- 90 X 9 F.B. (ST MARK TO BE FITTED.)
(BOTH ENDS CLIP EXCEPT SPECIFIED)
EXCEPT SPECIFIED
LAP 30 10 (TYP.)
MARK
DETAIL
50 CUT
10 50 LAP
DETAIL OF CELL GUIDE CONNECTION
MARK
DETAIL
SEC.
75X9
2107313-42/


DETAIL OF LOW. END
TYPICAL
CELL ANGLE L150×150×12
DBL. PL.
DBL. PL.22
8.5
⊗, ⊗ ONLY
DBL. PL.22
SEC.
DBL. PL.
2107313-43/

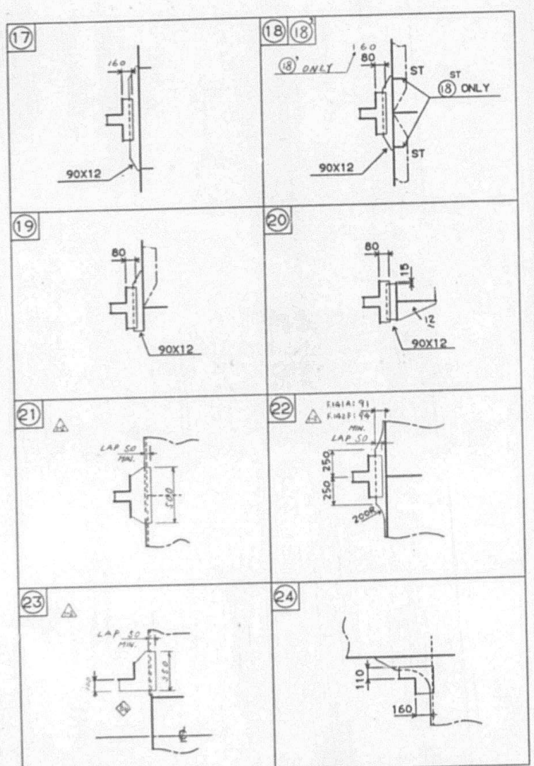
DETAIL OF CELL GUIDE RIB



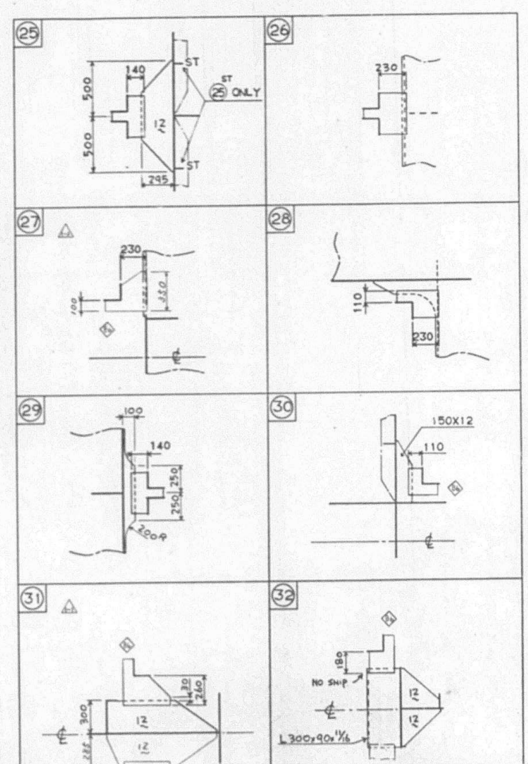
2107313 -44/



2107313 -45/



2107313 -46/



2107313 -47/47

APPROVAL OF OWNER & REGULATORY BODIES								
ALT. NO.	OWNER		USCG		ABS		USPH	
	DATE	LETTER NO.	DATE	LETTER NO.	DATE	LETTER NO.	DATE	LETTER NO.
ORIGINAL	23 MAY '76	OTTS/MES 473			11 AUG '76	T-P-2		
1ST PART REV	4 JUL '76				11 AUG '76	T-P-2		
2ND PART REV	31 JUL '76				19 SEP '76	T-P-2		
3RD PART REV	7 SEP '76				9 OCT '76	T-P-2		

FINISHEDPLAN

SHIPYARD AND SHIP'S NO. & NAME			
MITSUI TAMANO		MITSUBISHI KOBE	
NO. 1323	DOCTOR LYKES	NO. 1158	JAMES LYKES
NO. 1324	ALMERIA LYKES	NO. 1159	JOSEPH LYKES
NO. 1325	TILLIE LYKES	NO. 1164	SOLON TURMAN

MITSUI ENGINEERING & SHIPBUILDING CO., LTD.
TAMANO WORKS

SHIP DESIGN DEPARTMENT
MANAGER: T. Nishi
STRUCTURE DESIGN SEC.

SHIP'S NO.: 1325
SHIP'S NAME: TILLIE LYKES

コンテナー支持構造(第5倉)
CONT. SUPPORT CONST. (NO. 5 HOLD)

DATE (TEL. 3330)
SCALE: 1/100
LYKES REF. NO.: 120506
MITSUI DRAWING NO.: 2107314 R

(36 SHEETS WITH COVER)

PLAN RECORD			
ALT. NO.	MARK	ALTERATION/DESCRIPTION	DATE & SIGNATURE
		"PREPARED FOR S.NO.1323 AS FINISHED PLAN, CHANGED AS FOLLOWS.	
		△ MISCELLANEOUS REVISION (DESIGN DEVELOPMENT) MADE APPLICABLE TO S.NO.1324 AND S.NO.1325."	NOV. 18. '76

DWG. NO. 2107314 - 1/

NOTES:-

1. BOTH SIDES TO BE SYMMETRICAL EXCEPT SPECIFIED.
2. TRANS. SECTIONS TO BE "LOOKING FORE" EXCEPT SPECIFIED.
3. REFER TO "CONSTRUCTION DETAILS (DWG NO. 2100811)" FOR STRUCTURAL DETAILS OF MEMBERS, ETC. EXCEPT SPECIFIED.
4. REFER TO "WELDING TABLE (DWG NO. 2100832)" FOR LEG LENGTH OF WELDING EXCEPT SPECIFIED.

MATERIAL LIST

INFORMATION FOR MES ONLY (整理No.)

	ITEM	MTERIAL	NO	WT(TON) (NET)	SHOP	ARR. NO
①	ENTRY GUIDE	(STEEL CASTING)	16		1.船工	—
②	〃	〃				—
③	〃	〃	16		1.船工	—
④	〃	〃				—
⑤	〃	〃				—

備考:-

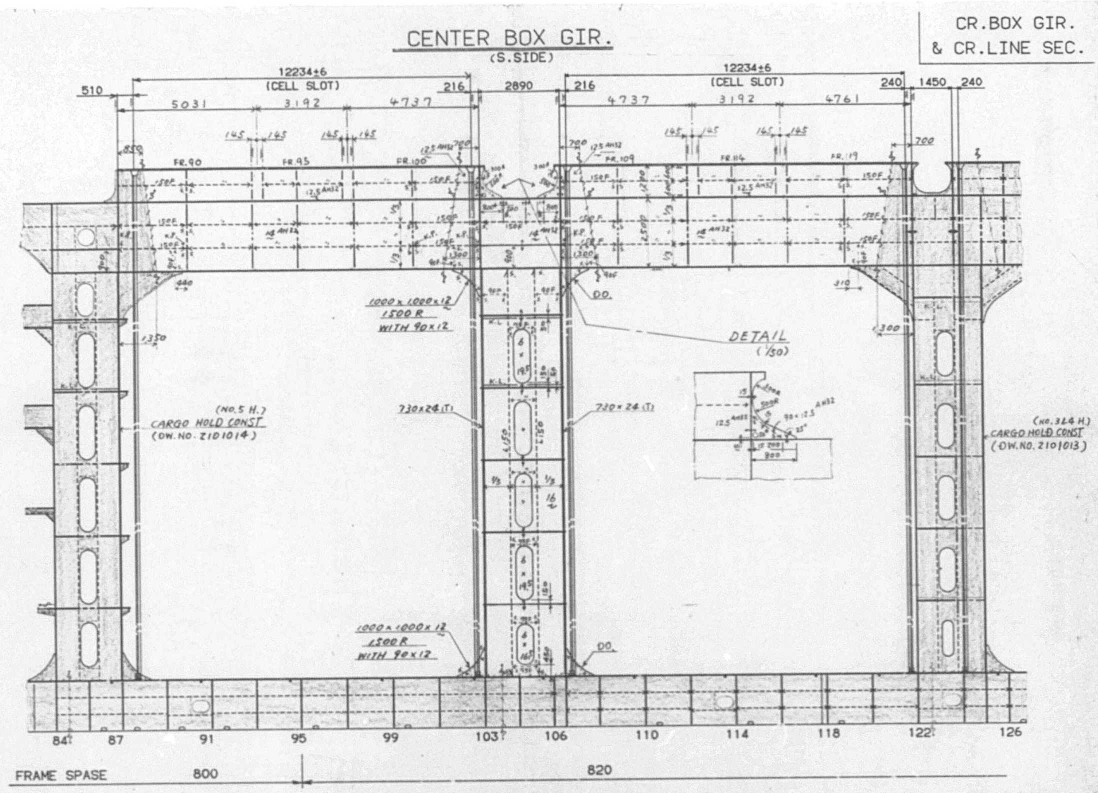
1. 特記の他は，両舷対称とする。
2. 横断面図は，特記の他は前面を示す。
3. 構造詳細については，特記の他は "構造詳細図(図番2100811)"を参照のこと。
4. 溶接脚長については，特記の他は "溶接脚長表(図番2100832)"を参照のこと。

2107314 - 2/

2107314 - 3/

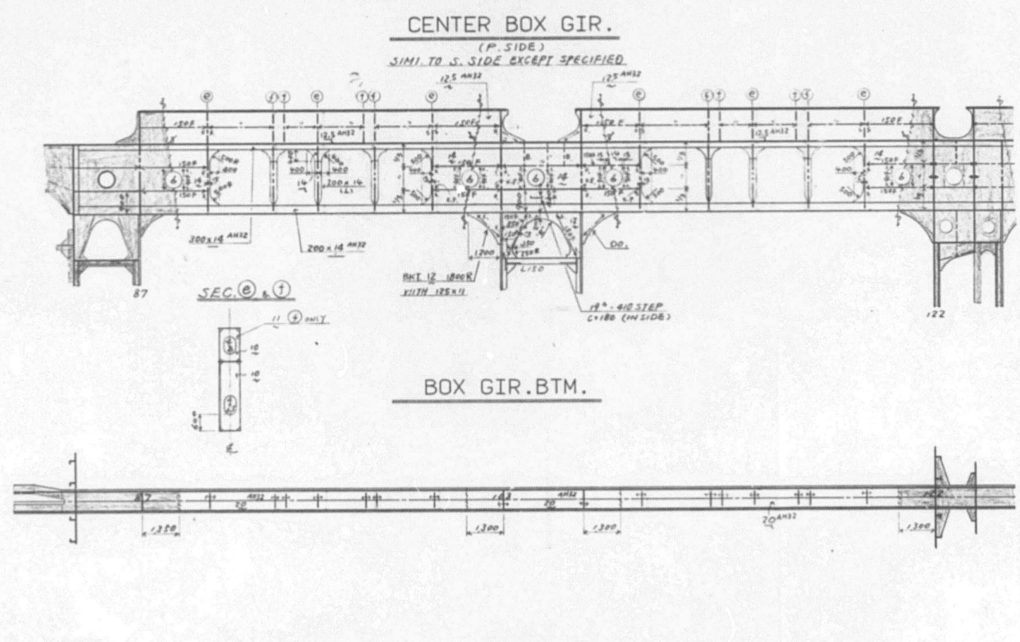
632

CR.BOX GIR.
& CR.LINE SEC.



2107314 - 4/

CR.BOX GIR.PSIDE
BOX GIR.BOT.



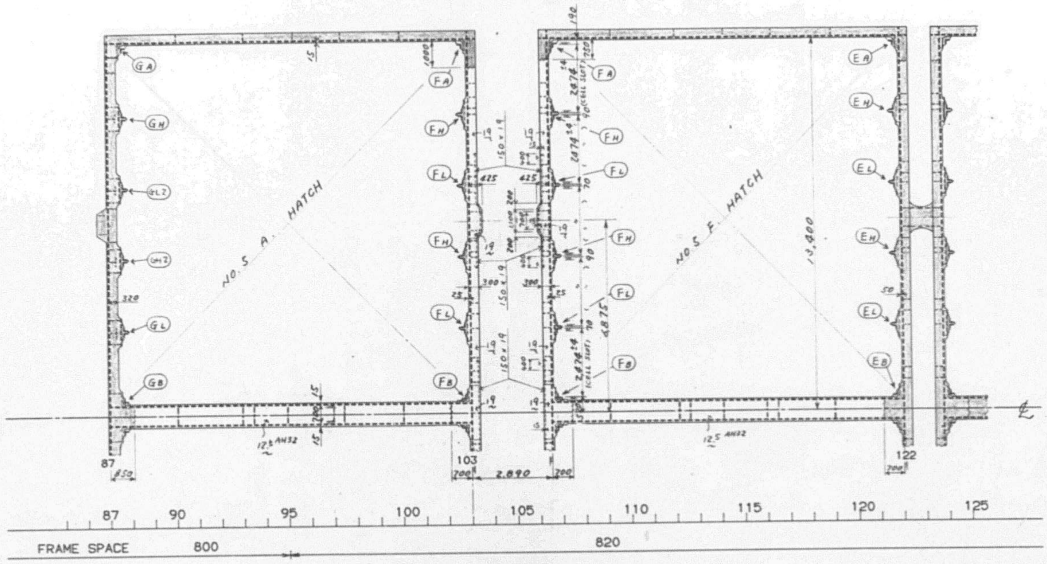
2107314 - 5/

633

HATCH COAM TOP

HATCH COAM TOP PLAN

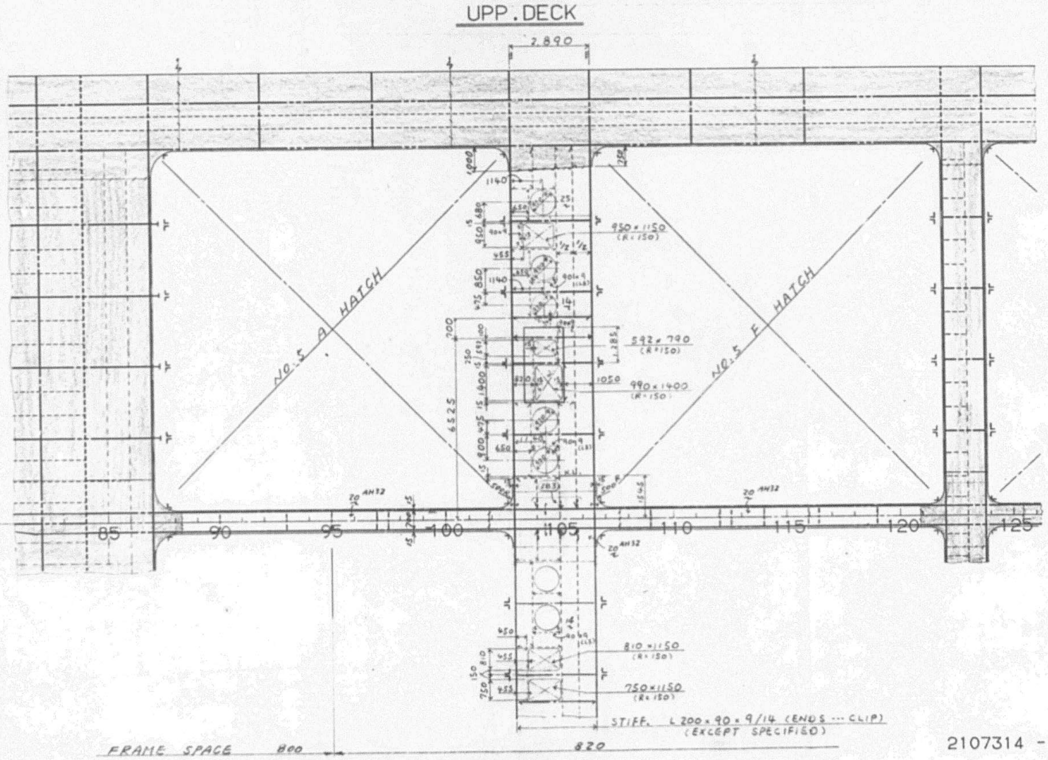
NO. 5 HOLD



2107314 - 6/

UPP.DK.

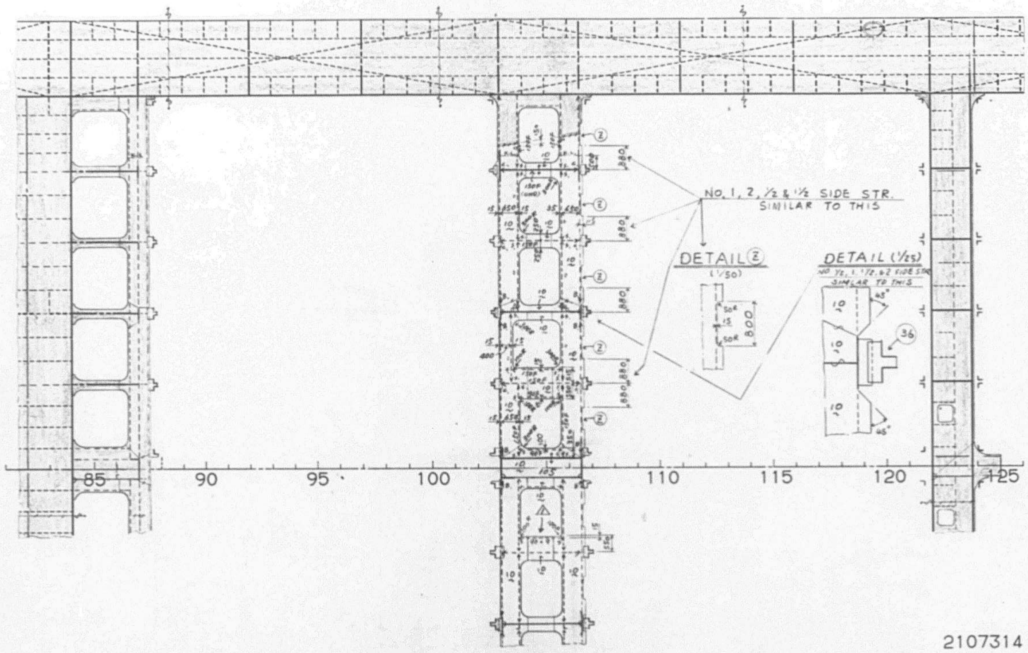
UPP.DECK



2107314 - 7/

PASS.DK

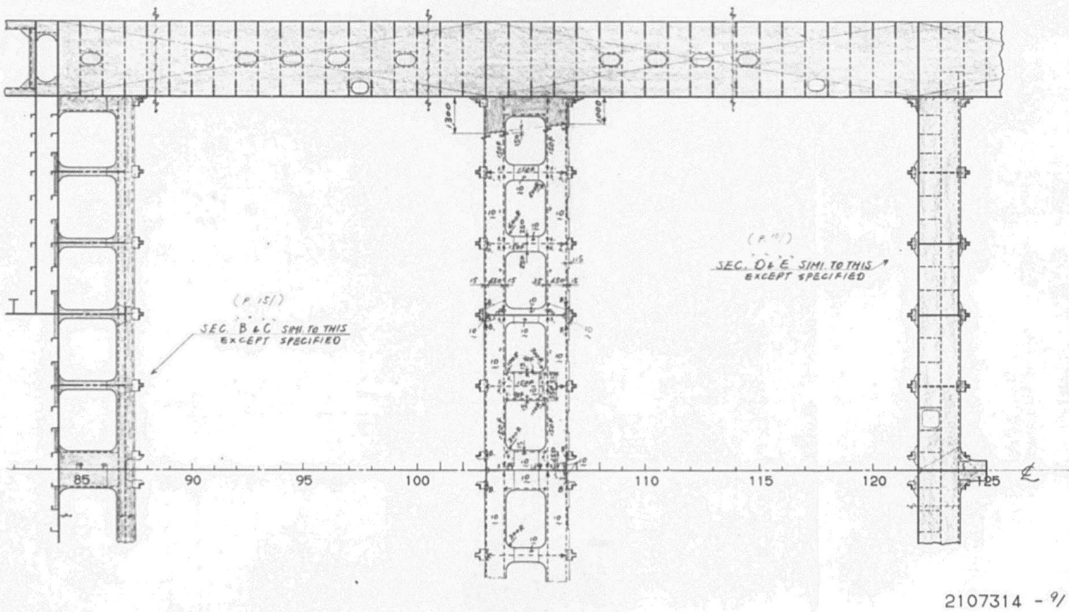
PASSAGE DECK



2107314 - 8/

NO.1 S.STR.

NO.1 SIDE STR.



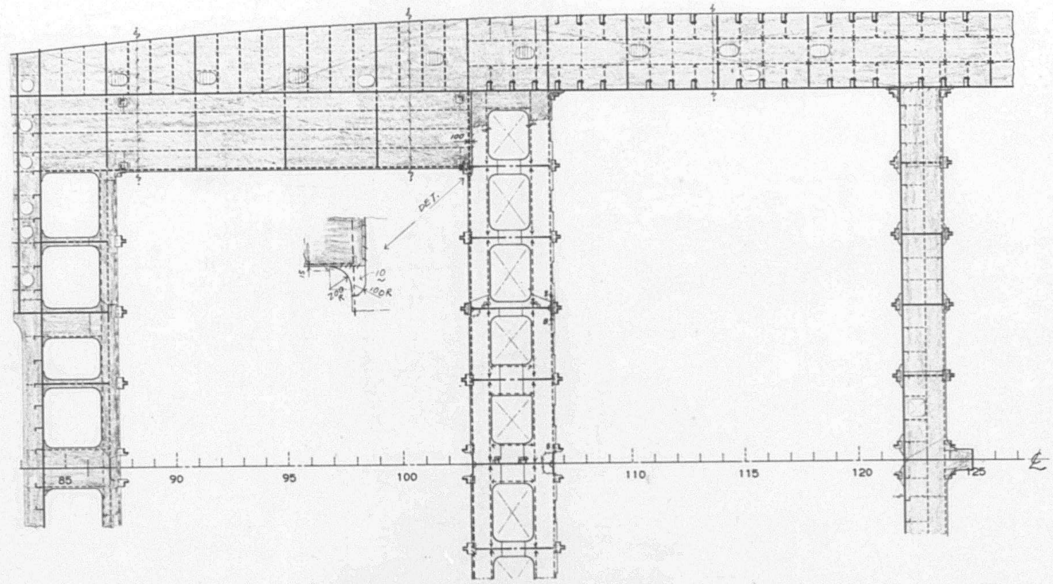
2107314 - 9/

635

NO.2 S.STR.

NO.2 SIDE STR.

SIMI. TO NO.1 S.STR. EXCEPT SPECIFIED



2107314 -10/

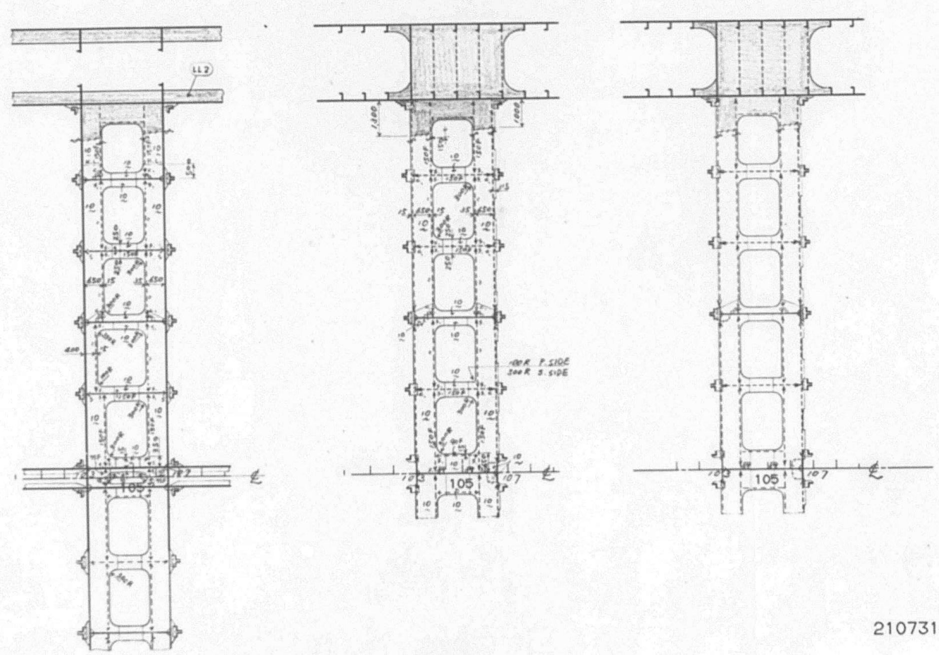
SEC.A
NO.1/2 S.STR.
NO.1 1/2 S.STR

SEC.A

NO.1/2 SIDE STR.

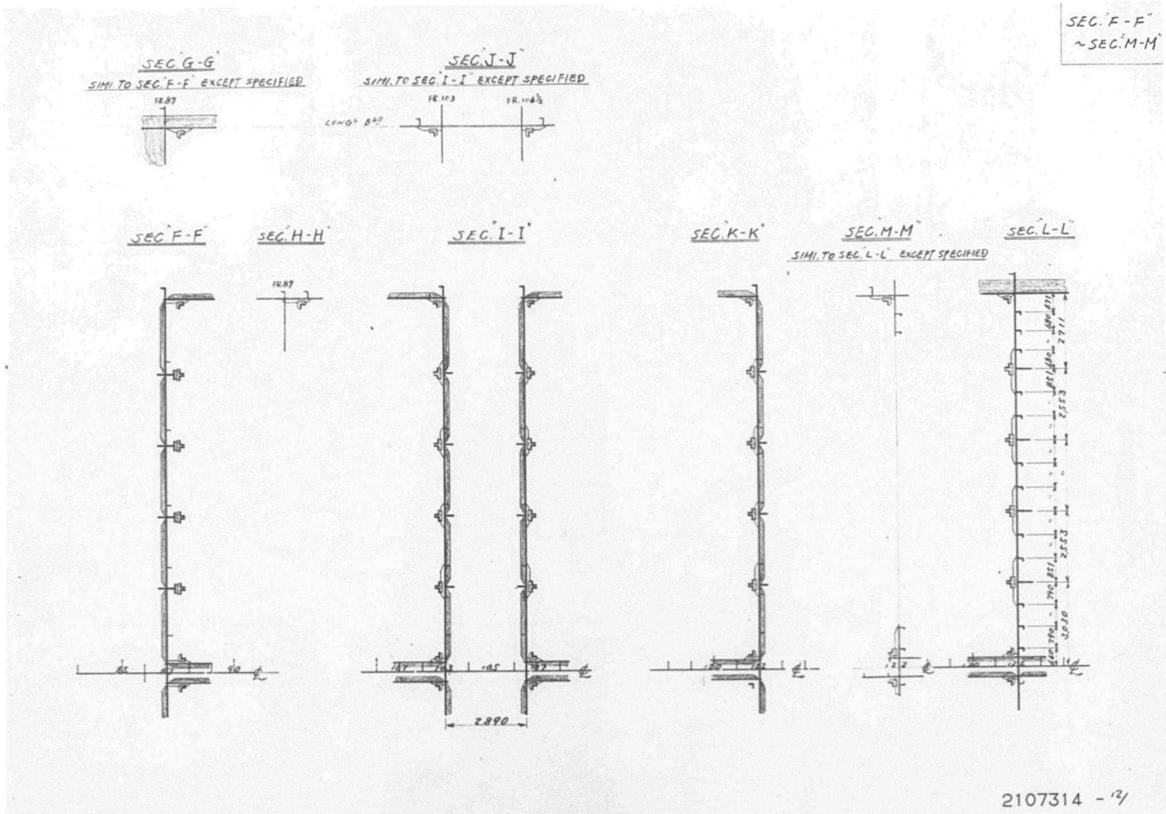
NO.1 1/2 SIDE STR.

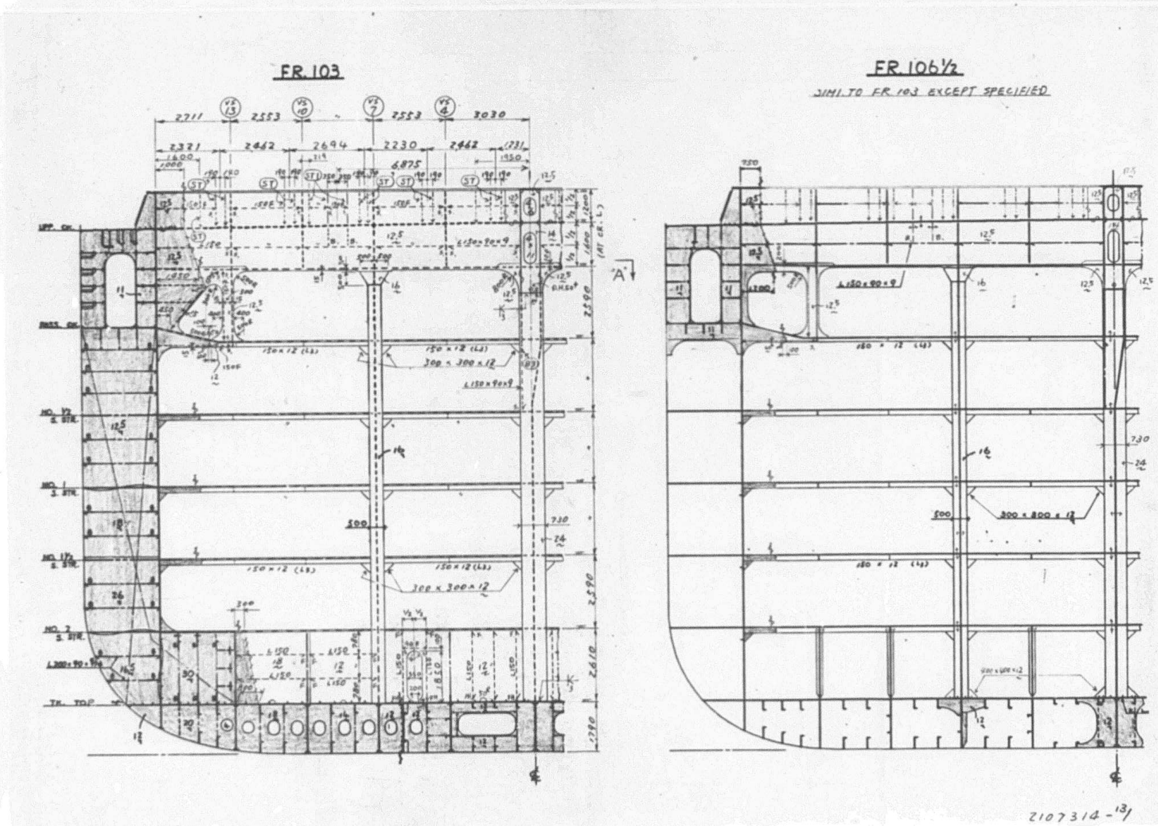
SIMI. TO NO.1/2 S. STR. EXCEPT SPECIFIED



2107314 -11/

636


SEC. 'F-F' ~SEC. 'M-M'
SEC. 'G-G'
SIMI. TO SEC. 'F-F' EXCEPT SPECIFIED
SEC. 'J-J'
SIMI. TO SEC. 'I-I' EXCEPT SPECIFIED
SEC. 'F-F'
SEC. 'H-H'
SEC. 'I-I'
SEC. 'K-K'
SEC. 'M-M'
SIMI. TO SEC. 'L-L' EXCEPT SPECIFIED
SEC. 'L-L'
2890
2107314 - 12/

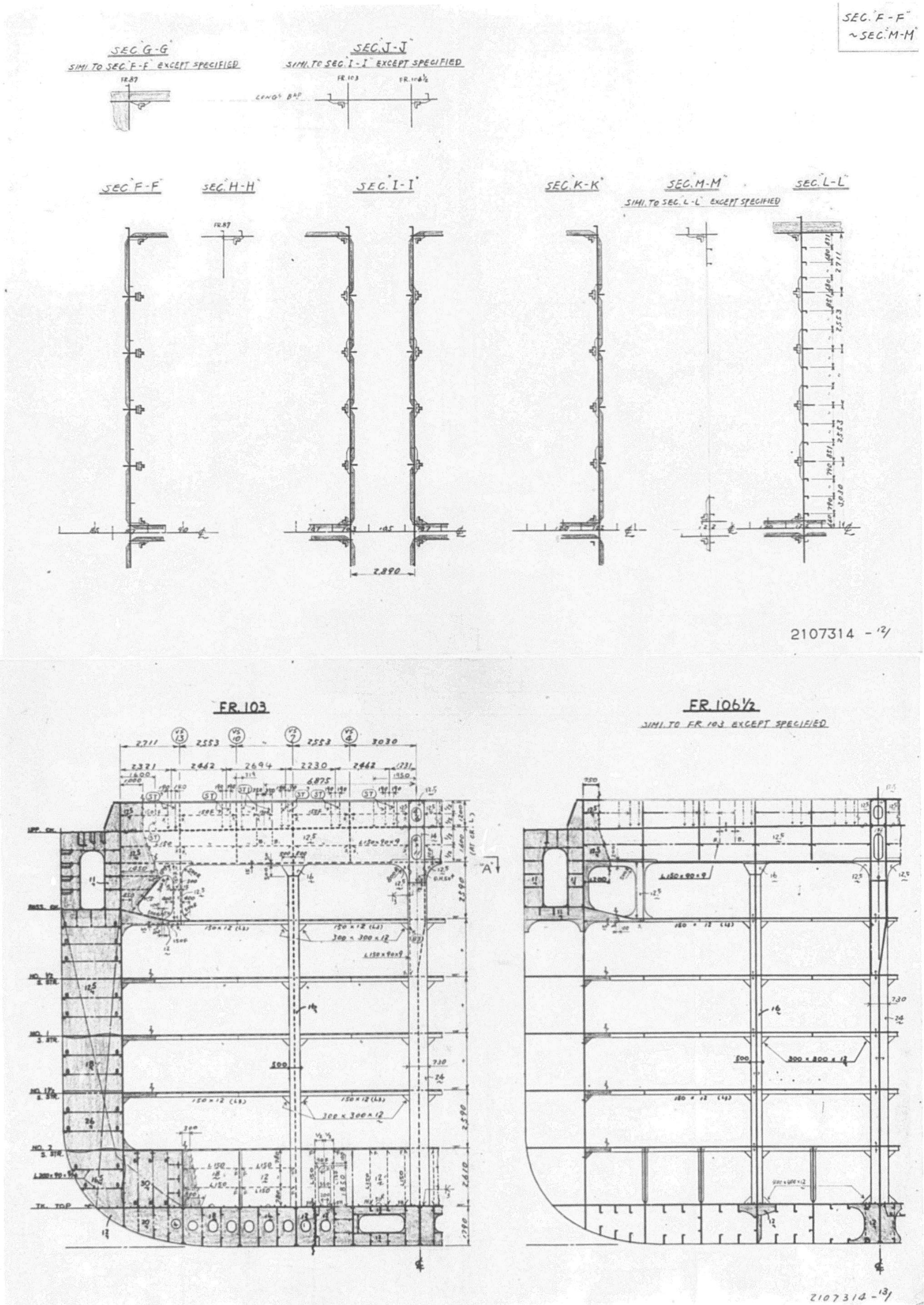

FR. 103
FR. 106½
SIMI. TO FR. 103 EXCEPT SPECIFIED
'A'
2107314 - 13/

636

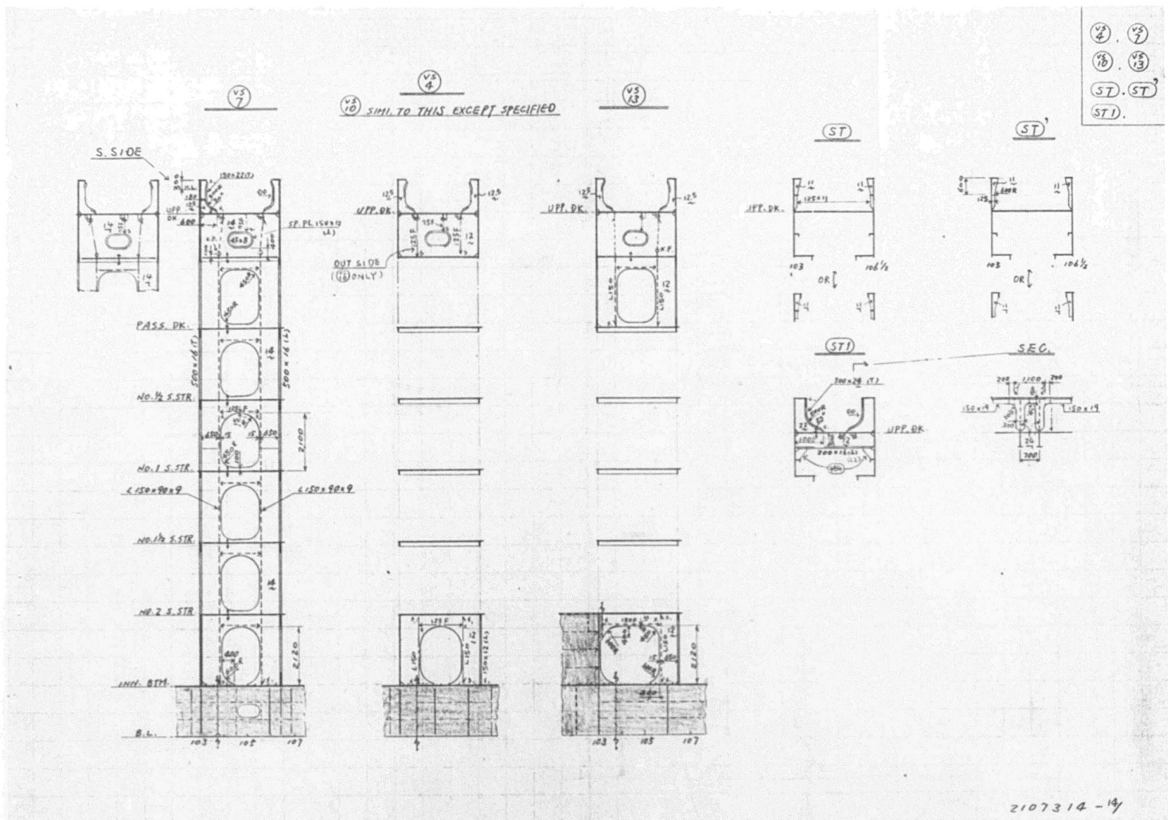
ATTENTION!

FILM NO. 636 (THE LAST FILM)

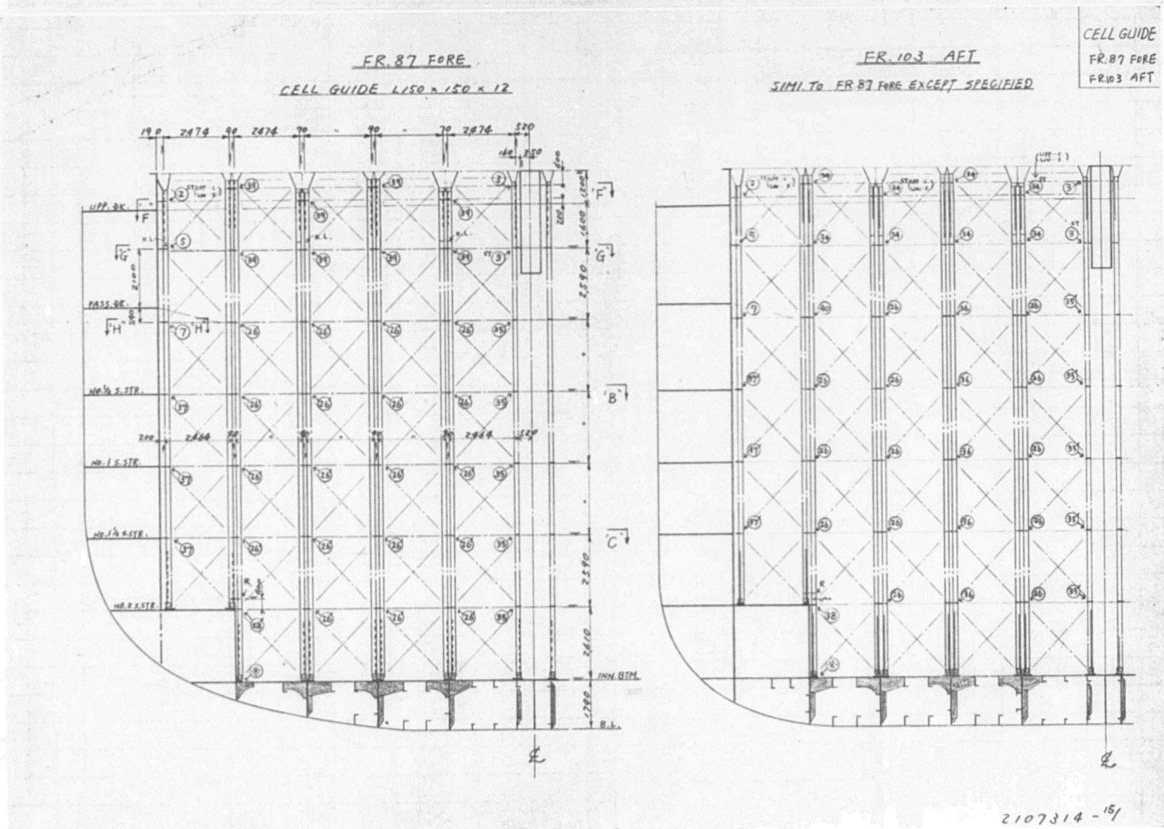
IS WRONG.



SEC. "F-F" ~SEC. "M-M"
SEC. G-G
SIMI. TO SEC. "F-F" EXCEPT SPECIFIED
SEC. J-J
SIMI. TO SEC. "I-I" EXCEPT SPECIFIED
SEC. F-F
SEC. H-H
SEC. I-I
SEC. K-K
SEC. M-M
SIMI. TO SEC. "L-L" EXCEPT SPECIFIED
SEC. L-L
2,890
2107314 - 12/
FR. 103
FR. 106½
SIMI. TO FR. 103 EXCEPT SPECIFIED
"A"
2107314 - 13/

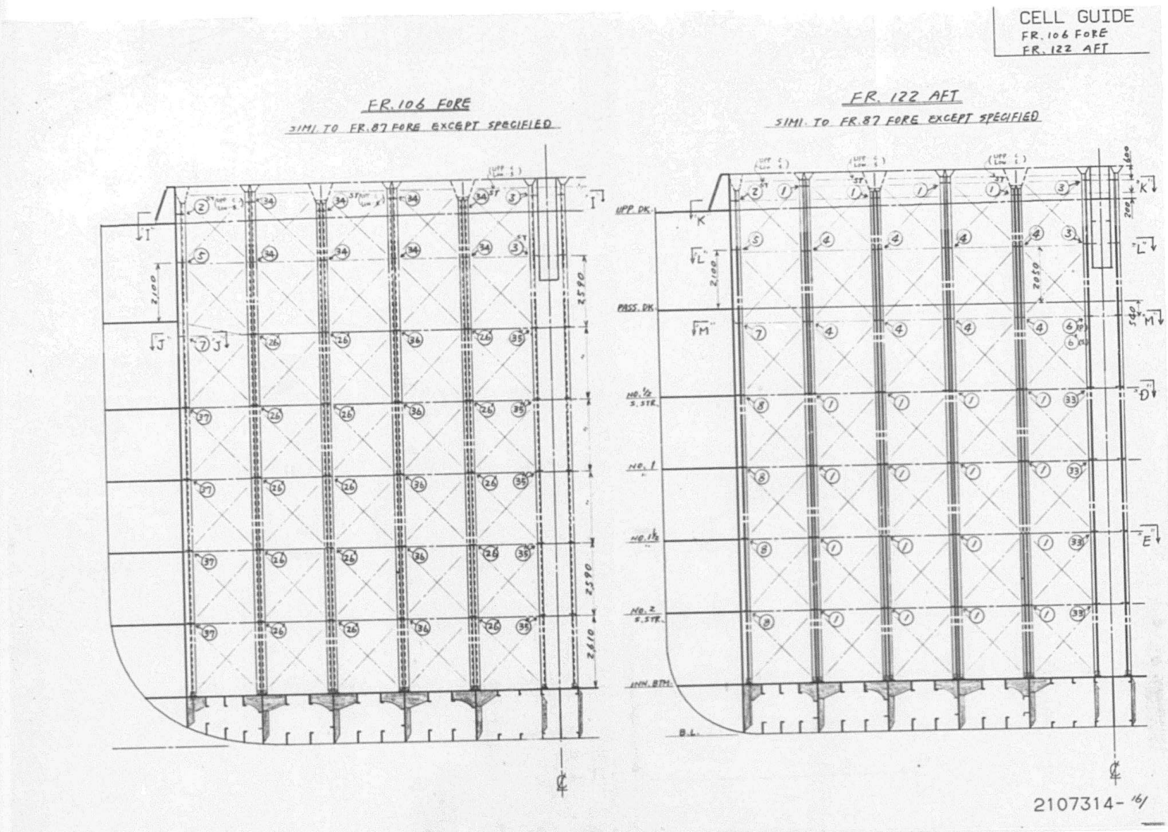


VS 4 . VS 7
VS 10 . VS 13
ST . ST'
ST1
VS 7
VS 4
VS 10 SIMI. TO THIS EXCEPT SPECIFIED
VS 13
ST
ST'
S. SIDE
UPP. DK.
PASS. DK.
NO. 1/2 S. STR.
NO. 1 S. STR.
NO. 1 1/2 S. STR.
NO. 2 S. STR.
INN. BTM.
B.L.
OUT SIDE
ST1
SEC.
2107314 - 14

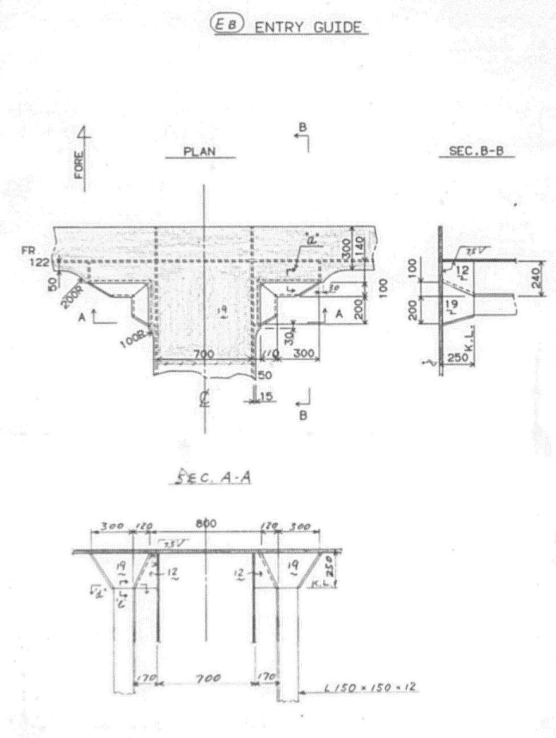


FR. 87 FORE
CELL GUIDE L150 × 150 × 12
FR. 103 AFT
SIMI. TO FR. 87 FORE EXCEPT SPECIFIED
CELL GUIDE
FR. 87 FORE
FR. 103 AFT
UPP. DK.
PASS. DK.
NO. 1/2 S. STR.
NO. 1 S. STR.
NO. 1 1/2 S. STR.
NO. 2 S. STR.
INN. BTM.
B.L.
2107314 - 15

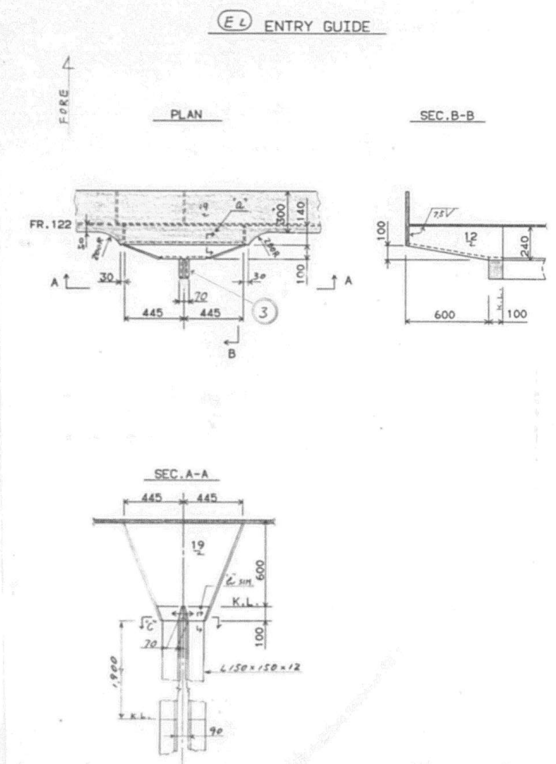
638



2107314-16/

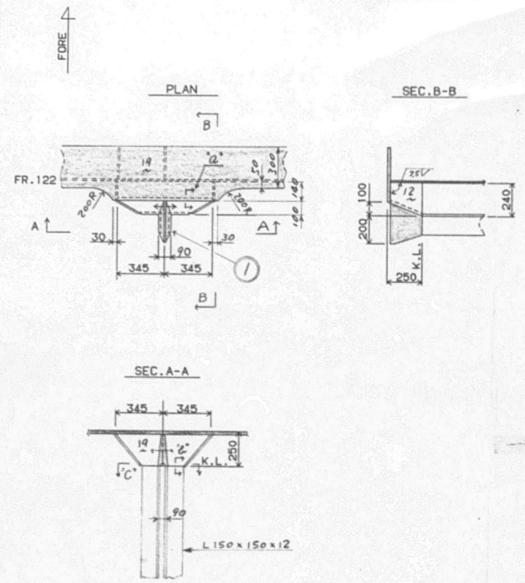


2107314 -17/



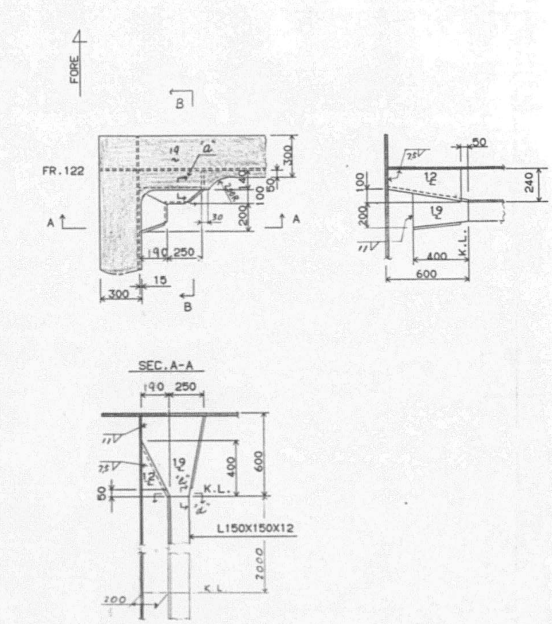
2107314 -18/

(EH) ENTRY GUIDE



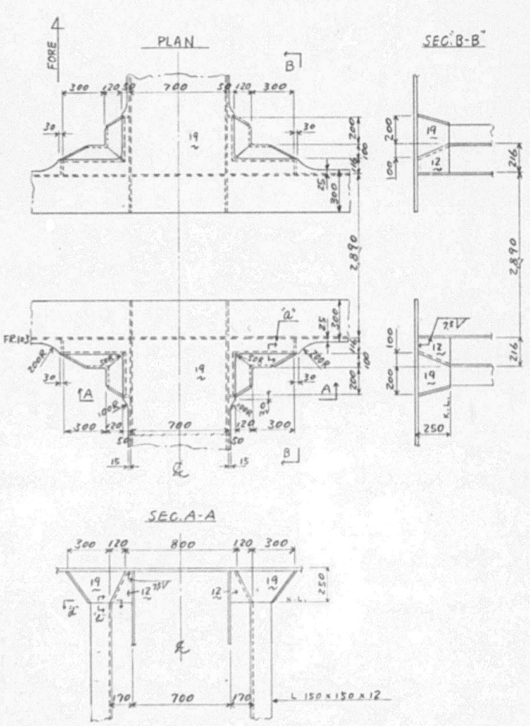
2107314 -19/

(EA) ENTRY GUIDE



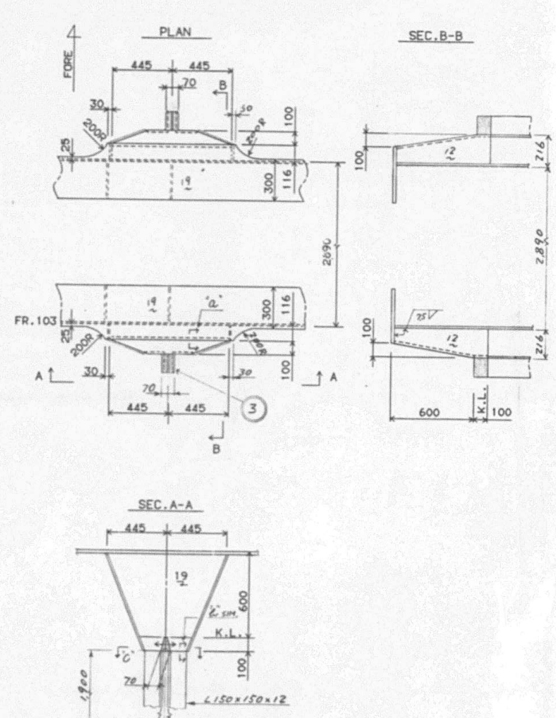
2107314 -20/

(FB) ENTRY GUIDE



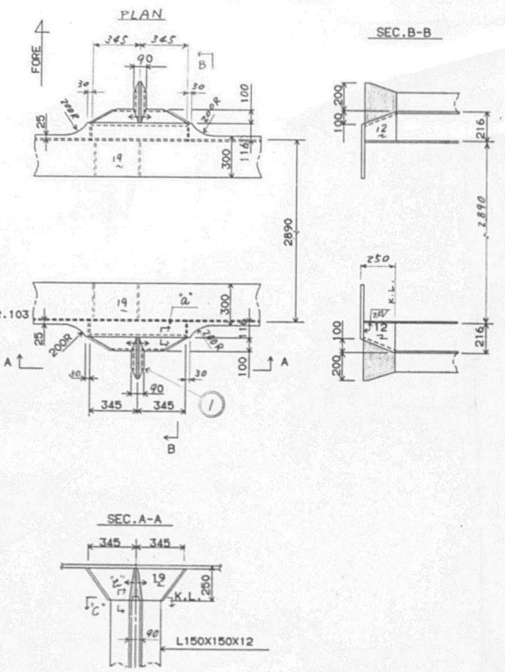
2107314 -21/

(FL) ENTRY GUIDE



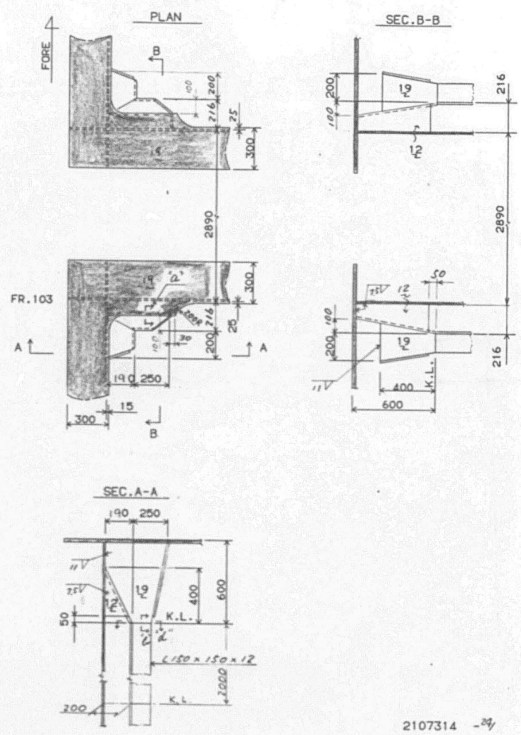
2107314 -22/

(FH) ENTRY GUIDE



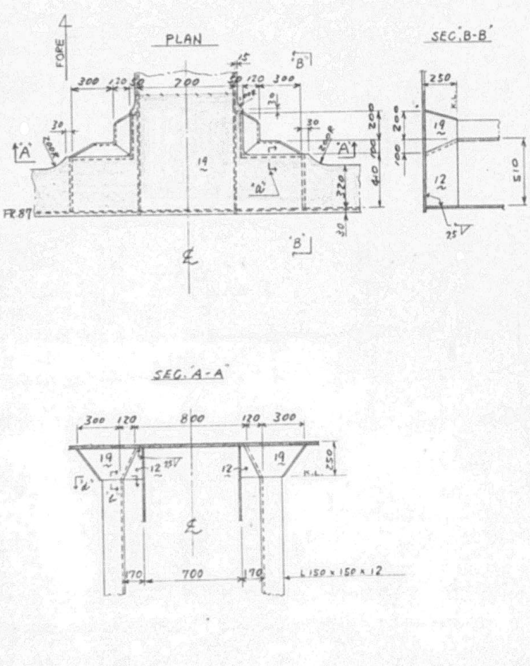
2107314 -23

(FA) ENTRY GUIDE



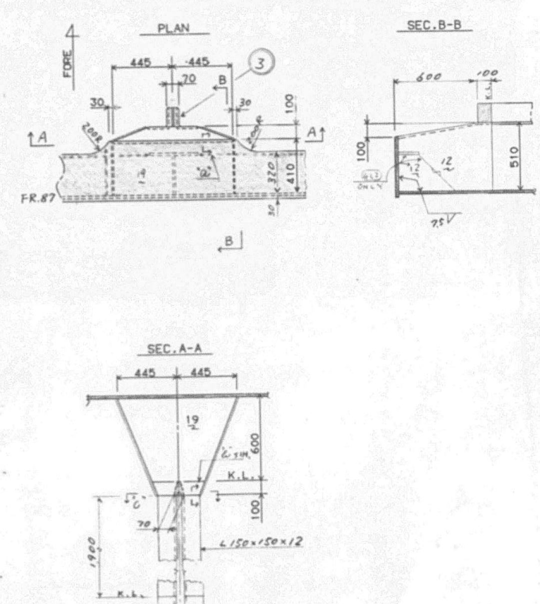
2107314 -24

(GB) ENTRY GUIDE

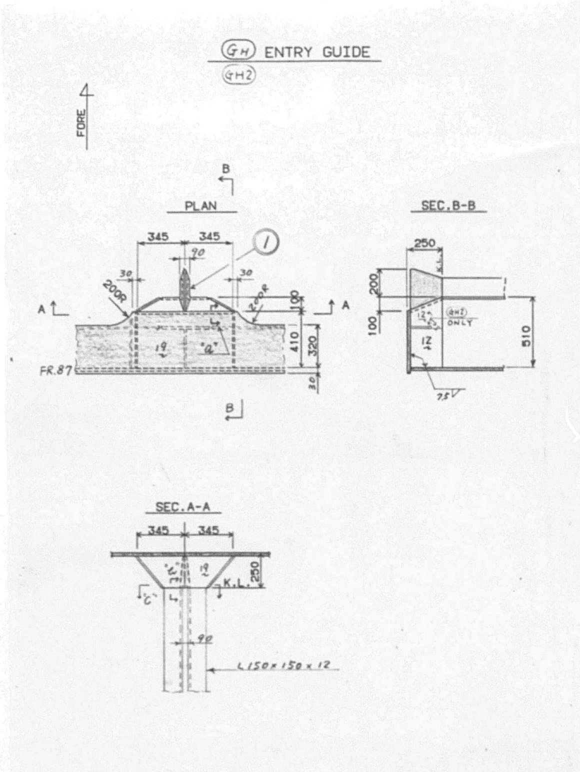


2107314 -25

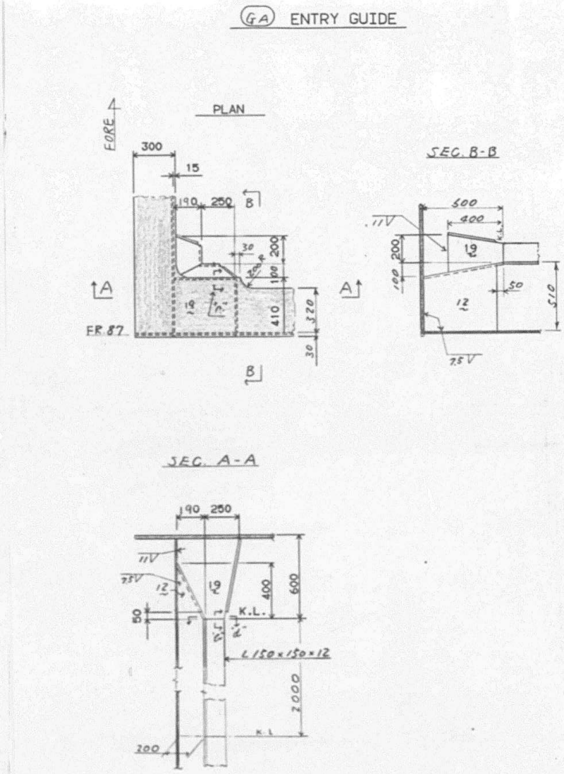
(GL) (GL2) ENTRY GUIDE



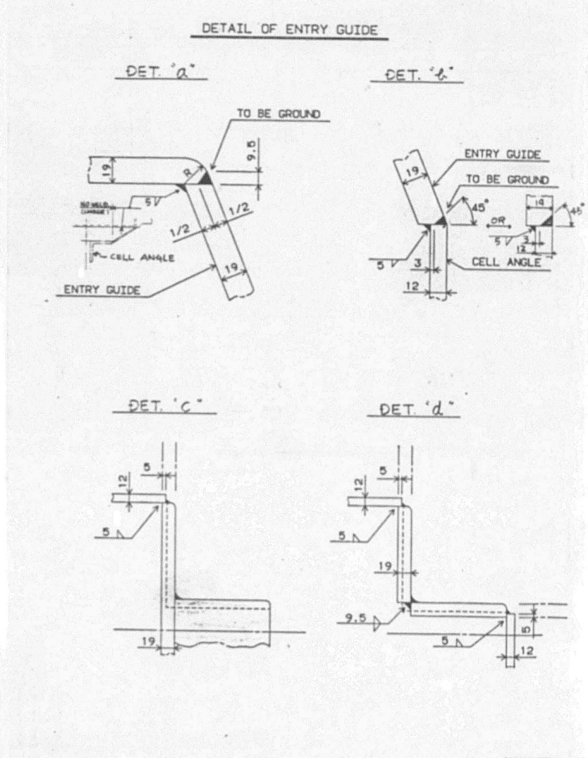
2107314 -26



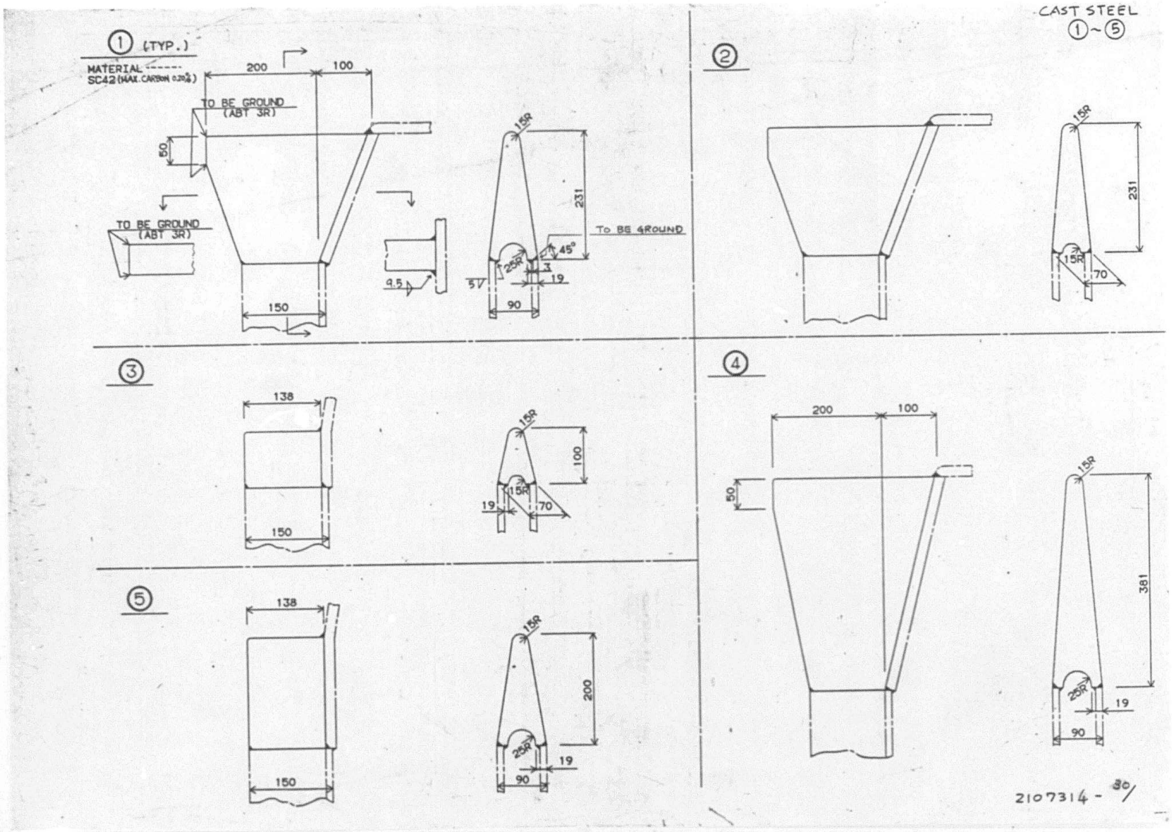
2107314 -27

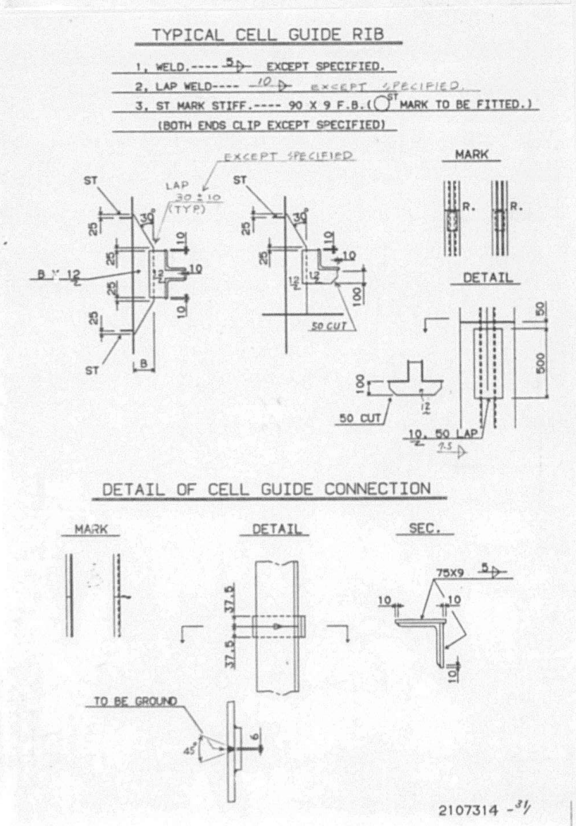


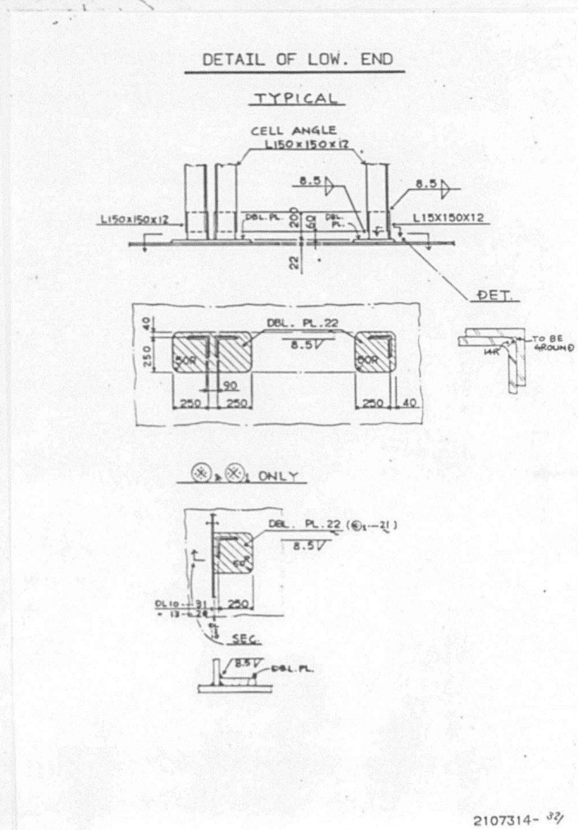
2107314 -28



2107314 -29

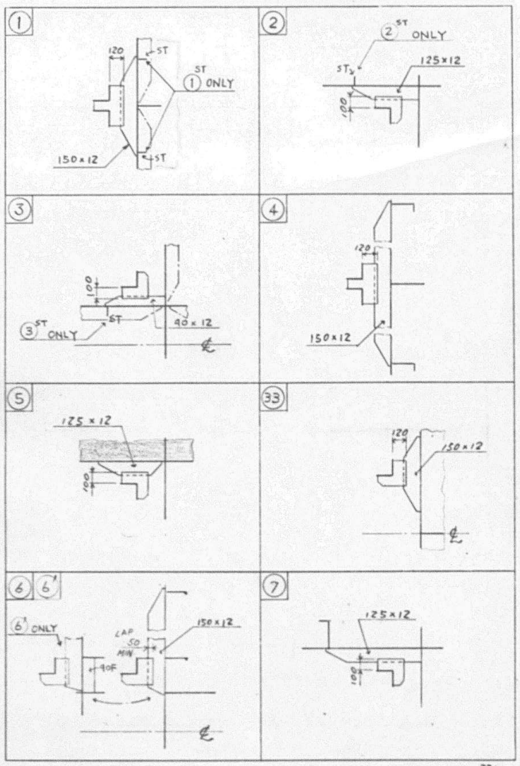

CAST STEEL ①~⑤
① (TYP.)
MATERIAL -----
SC42 (MAX. CARBON 0.2%)
TO BE GROUND (ABT 3R)
TO BE GROUND
②
③
④
⑤
2107314 - 30/


TYPICAL CELL GUIDE RIB
1. WELD.---- 5 EXCEPT SPECIFIED.
2. LAP WELD---- 10 EXCEPT SPECIFIED.
3. ST MARK STIFF.---- 90 X 9 F.B. (ST MARK TO BE FITTED.)
(BOTH ENDS CLIP EXCEPT SPECIFIED)
EXCEPT SPECIFIED
LAP 30 ± 10 (TYP)
MARK
DETAIL
50 CUT
10 50 LAP
DETAIL OF CELL GUIDE CONNECTION
MARK
DETAIL
SEC.
75X9
TO BE GROUND
2107314 - 31/


DETAIL OF LOW. END
TYPICAL
CELL ANGLE L150 x 150 x 12
L150x150x12
L15X150X12
DBL. PL.
DET.
DBL. PL. 22
TO BE GROUND
ONLY
DBL. PL. 22
SEC.
DBL. PL.
2107314- 32/

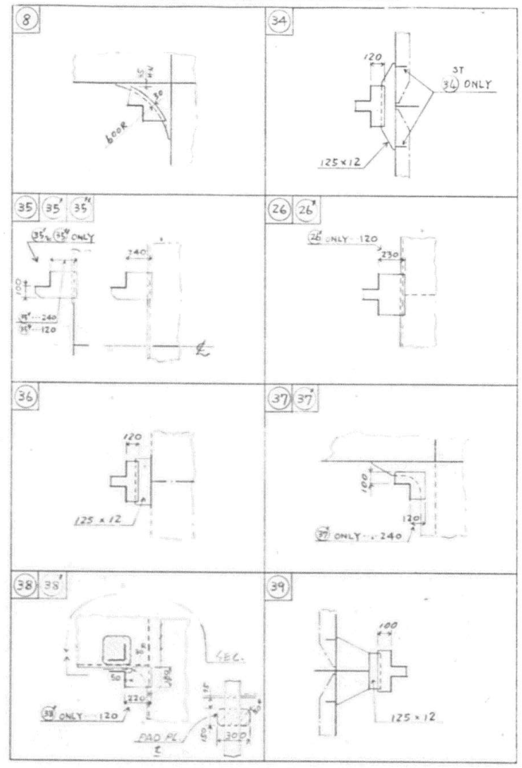
643

DETAIL OF CELL GUIDE RIB



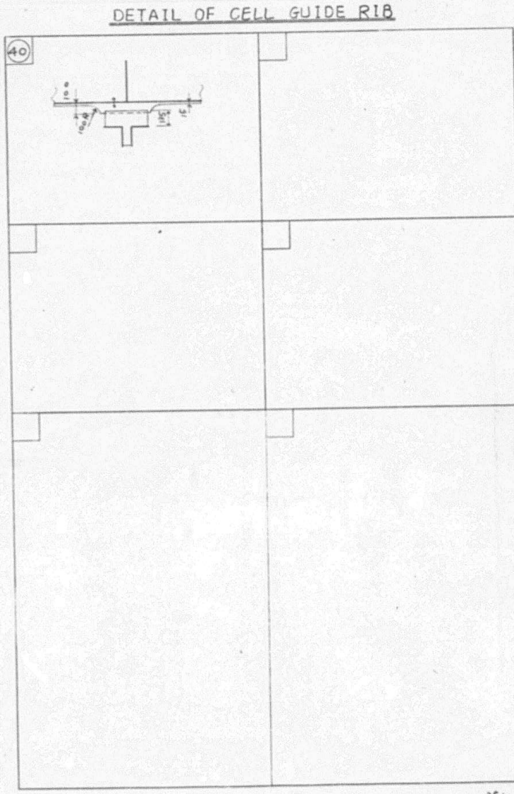
2107314-33/

DETAIL OF CELL GUIDE RIB



2107314-34

DETAIL OF CELL GUIDE RIB



2107314-35/35

PLAN RECORD BY MHI

ALT. NO.	MARK	DESCRIPTION	DATE	BY
ORIG.	—	FOLLOWED MES ORIGINAL PLAN	APR. 23 '85	
-10	4	SUBMITTED FOR APPROVAL OF OWNER AND ABS PREPARED TO MODIFICATION FOR MHI BUILDING SHIPS. 1. MODIFIED BLOCK BUTT JOINTS ON CENTER LINE LONGL BOX GIRDER AND HATCH COAMING. 2. SHIFTED BLOCK BUTT JOINTS ON CONTAINER SUPPORT CONSTRUCTION IN WAY OF LONGL BULKHEAD. BASED DWG. MES DWG NO. 2107314 (INCL. PARTLY REVISED PLAN NO.1)	JUN. 13 '85	To.H. / H.Ko.
-11		FOLLOWED MES PARTLY REVISED PLAN NO. 2	JUL. 22 '85	H.Ko.
-12	6	1. PENETRATED CENTER LINE VERT. WEB AT HORIZONTAL GIRDER IN PASS. DECK LEVEL. 2. ADDED BLOCK BUTT JOINTS ON EACH HORIZONTAL GIRDER AND TRANS WEB. 3. PENETRATED NO. 2 HORIZONTAL GIRDER AT VS 7 VERTICAL WEB. 4. DELETED BLOCK BUTT JOINTS ON FR. 103 WEB. 5. DELETED ADJUSTING PIECE OF LOWER END OF CELL GUIDE. 6. MODIFIED SHAPE OF CELL GUIDE RIBS. 7. MODIFIED TYPE OF HATCH END COAMING STAY FROM TYPE (5T) TO TYPE (5T).	AUG. 5 '85	To.H. / H.Ko.
-13		FOLLOWED MES PARTLY REVISED PLAN NO. 3	SEP. 6 '85	H.Ko.

35 SHEETS WITH COVER

CON-FERRED	SHIP DESIGNING DEPARTMENT HULL DESIGNING SECTION	CLASS ABS
	APPROVED To. Hirayama / H. Kokaute	コンテナー支持構造（第5倉）
	CHECKED S. Furuhashi	CONT. SUPPORT CONST. (NO.5 HOLD)
	DRAWN	
	SCALE	
	ORDER 01-15800 ~~01-15800~~ ~~01-16400~~	ITEM / DRAWING NO. HS-19440-F / LYKES REF. NO. 120506

MITSUBISHI HEAVY INDUSTRIES, LTD.
KOBE SHIPYARD & ENGINE WORKS

DRAWN ISSUED

0-4

PLAN RECORD BY MHI (CONTINUE)

ALT. NO.	MARK	DISCRIPTION	DATE	BY
-14	C	1. PENETRATED HATCH COAMING TOP PLATE AT FR. 103 1/2 FAN ROOM AFT WALL. 2. MODIFIED HATCH END COAMING STAY. 3. ADDED PARTIAL WALL OF FAN ROOM. 4. ADDED BLOCK BUTT JOINTS ON FR. 103 & FR. 106 1/2 TRANS BOX GIRDER.	NOV. 29 '85	H.Ko.
-F	—	PREPARED AS FINISHED PLAN FOR S. NO. 1158	MAR. 11 '87	H.Ko.

0-2

APPROVAL OF OWNER & REGULATORY BODIES

ALT. NO.	OWNER DATE	OWNER LETTER NO.	USCG DATE	USCG LETTER NO.	ABS DATE	ABS LETTER NO.	USPH DATE	USPH LETTER NO.
ORIGINAL	25 MAY '85	SPTS/485-473						
PART. REV. PLAN NO. 1	2 JUL '85	SPTS/485-660						

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SHIPYARD AND SHIP'S NO. & NAME			
~~MITSUI TAMANO~~		MITSUBISHI KOBE	
NO. 1323	~~DOCTOR LYKES~~	NO. 1158	JAMES LYKES
NO. 1324	~~ALMERIA LYKES~~	NO. 1159	~~JOSEPH LYKES~~
NO. 1325	~~TILLIE LYKES~~	NO. 1164	~~SOLON TURMAN~~

MITSUI ENGINEERING & SHIPBUILDING CO., LTD.
TAMANO WORKS

SHIP DESIGN DEPARTMENT MANAGER / SHIP'S NO. / SHIP'S NAME

STRUCTURE DESIGN SEC.
SEC. CHIEF N. Yamamoto
ASSIST. CHIEF
CHARGE ENG'R
STAFF M.O.

PARTLY REVISED PLAN NO. 3

コンテナー支持構造（第5倉）
CONT. SUPPORT CONST. (NO.5 HOLD)

DATE (TEC2330) / JOB NO. TS1323/24/25 / SCALE 1/100 / LYKES REF. NO. 120506 / MITSUI DRAWING NO. 2107314-3

(3 SHEETS WITH COVER)

0-3/

PLAN RECORD

ALT. NO.	MARK	ALTERATION/DESCRIPTION	DATE & SIGNATURE
ORIGINAL		PREPARED FOR APPROVAL OF OWNER & ABS	MARCH 27 '85
1	1	MISCELLANEOUS RIVESION (DESIGN DEVELOPMENT)	MAY 28 '85
2	2	MISCELLANEOUS RIVESION (DESIGN DEVELOPMENT) DESIGN DEVELOPMENT & OWNERS COMMENT	JUL. 9 '85 H.Y
3	3	MISCELLANEOUS RIVESION (DESIGN DEVELOPMENT)	AUG. 22 '85 M.O.

DWG. NO. 2107314-#1/1

645

NOTES:-

1. BOTH SIDES TO BE SYMMETRICAL EXCEPT SPECIFIED.
2. TRANS. SECTIONS TO BE "LOOKING FORE" EXCEPT SPECIFIED.
3. REFER TO "CONSTRUCTION DETAILS (DWG NO. 2100811)" FOR STRUCTURAL DETAILS OF MEMBERS, ETC. EXCEPT SPECIFIED.
4. REFER TO "WELDING TABLE (DWG NO. 2100832)" FOR LEG LENGTH OF WELDING EXCEPT SPECIFIED.

MATERIAL LIST

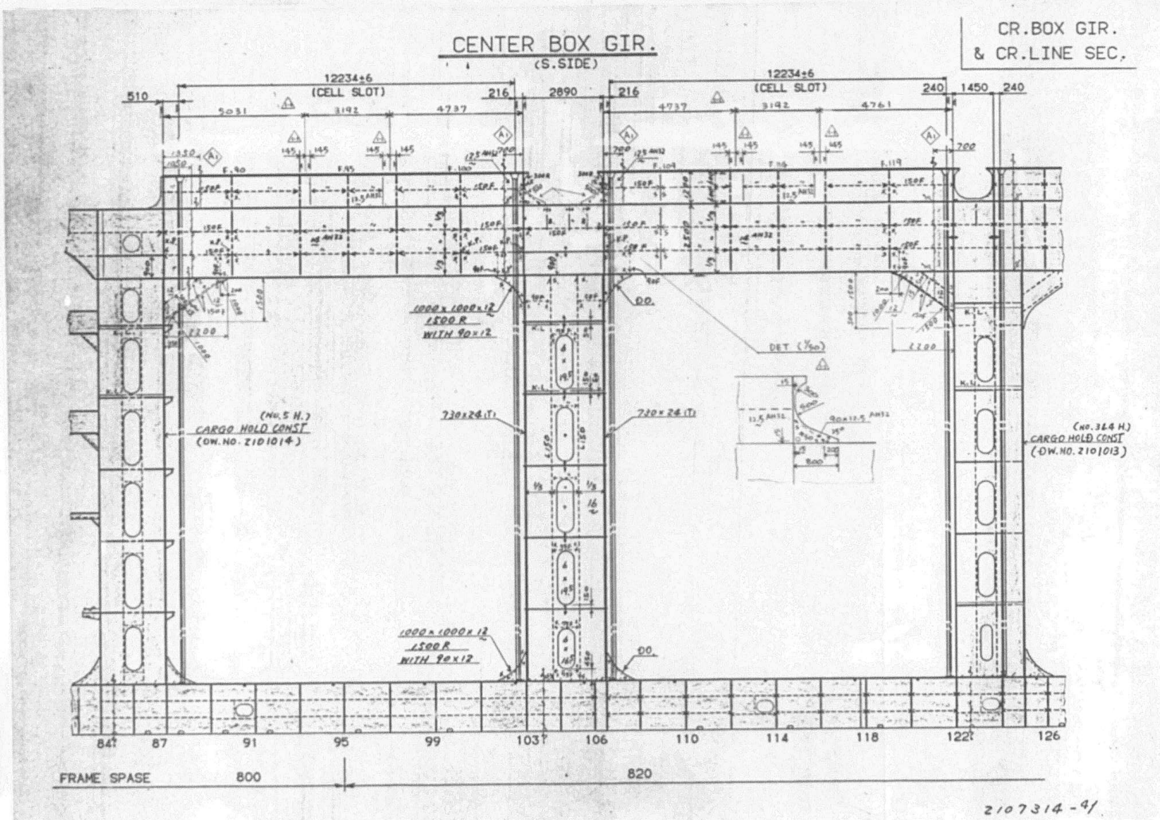
	ITEM	MTERIAL	NO	WT(TON) (ABT)
①	ENTRY GUIDE	(STEEL CASTING) SC 42 (MAX CARBON 0.20%)	16	
③	〃	〃	16	

備 考:-

1. 特記の他は，両舷対称とする。
2. 横断面図は，特記の他は後面を示す。
3. 構造詳細については，特記の他は "構造詳細図（図番 2100811）" を参照のこと。
4. 溶接脚長については，特記の他は "溶接脚長表（図番 2100832）" を参照のこと。

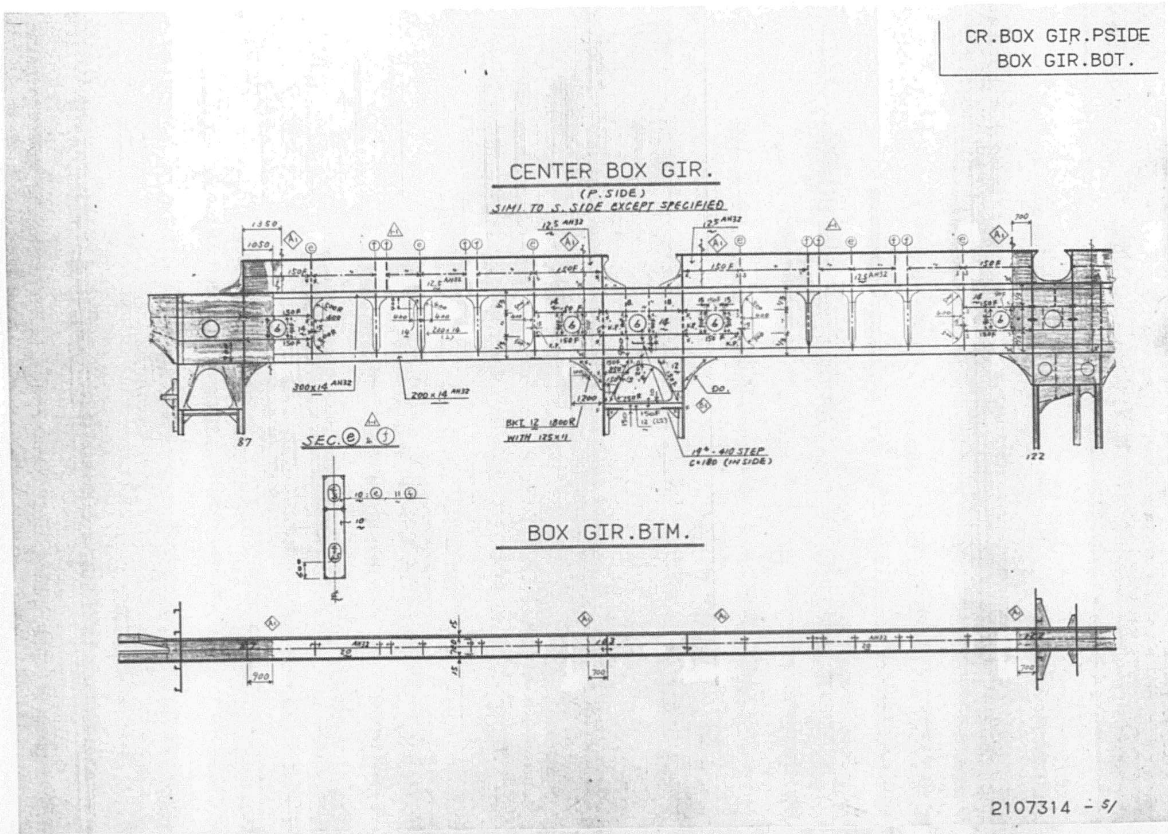
2107314 - 2/

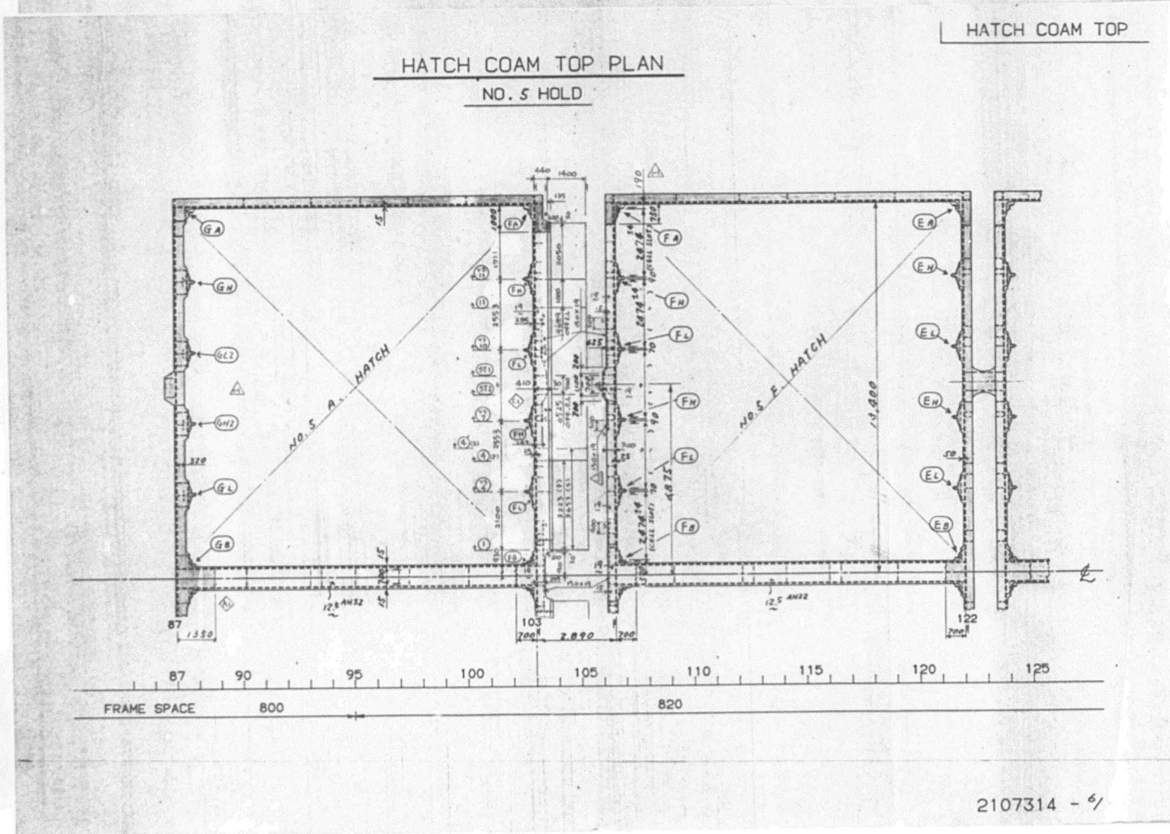
2107314 - 3/



2107314 - 4/

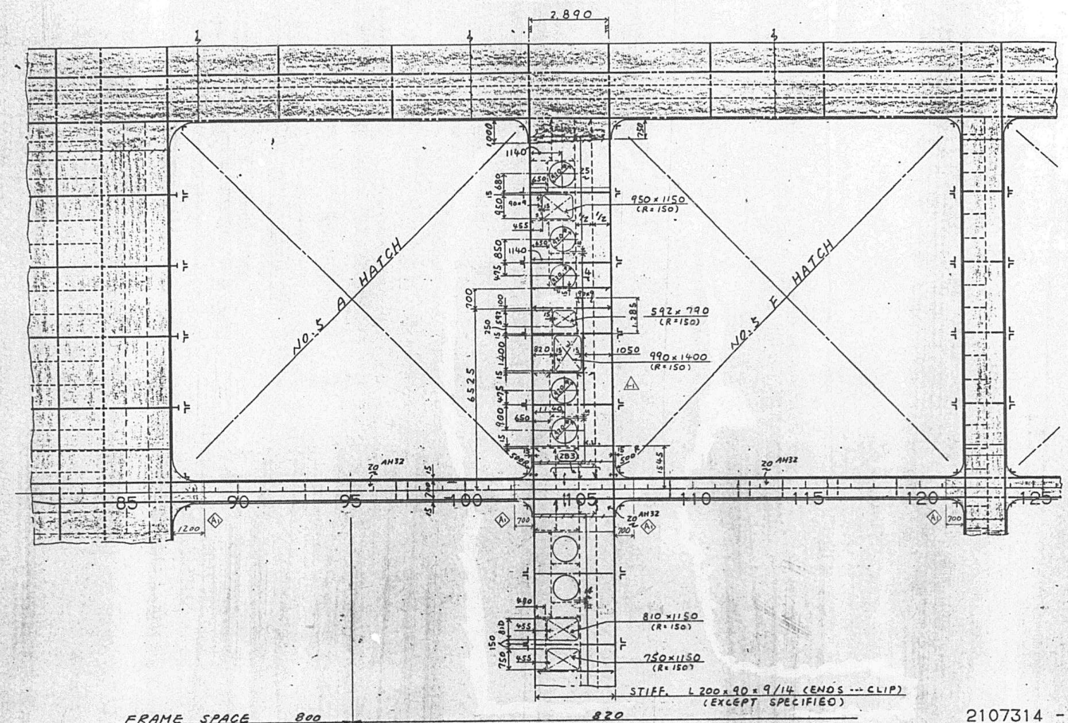
646


CR.BOX GIR.PSIDE
BOX GIR.BOT.
CENTER BOX GIR.
(P.SIDE)
SIMI TO S. SIDE EXCEPT SPECIFIED
SEC. ⓔ & ⓕ
BOX GIR.BTM.
2107314 - 5/


HATCH COAM TOP
HATCH COAM TOP PLAN
NO. 5 HOLD
NO. 5 A HATCH
NO. 5 E HATCH
FRAME SPACE
800
820
2107314 - 6/

647

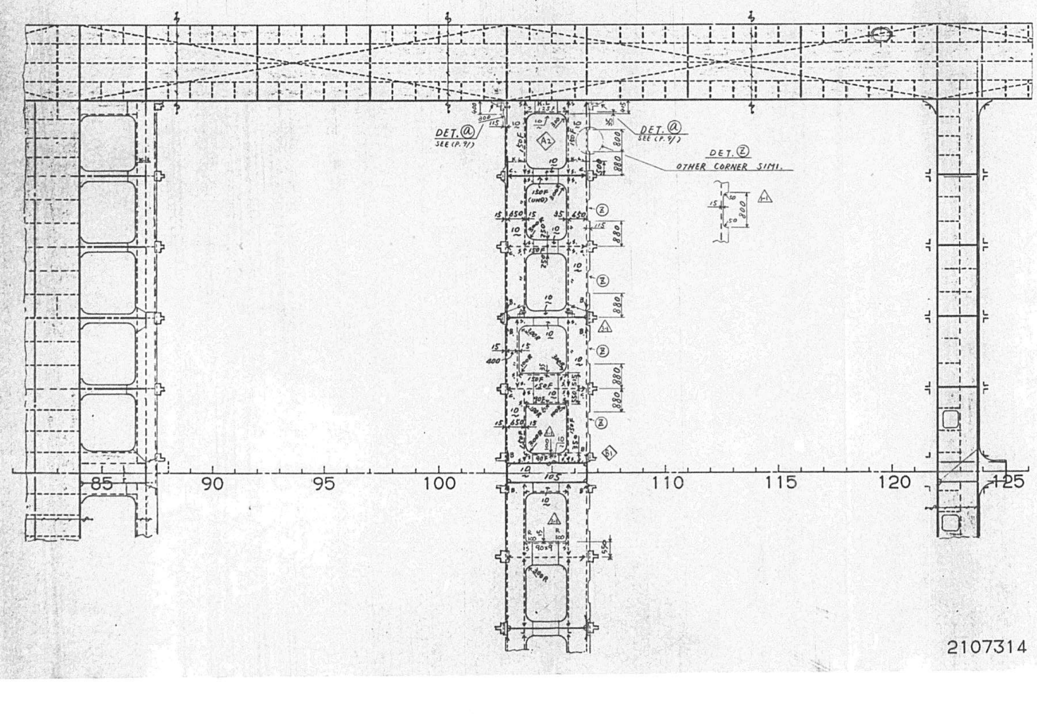
UPP. DECK



2107314 - 7/

PASS. DK

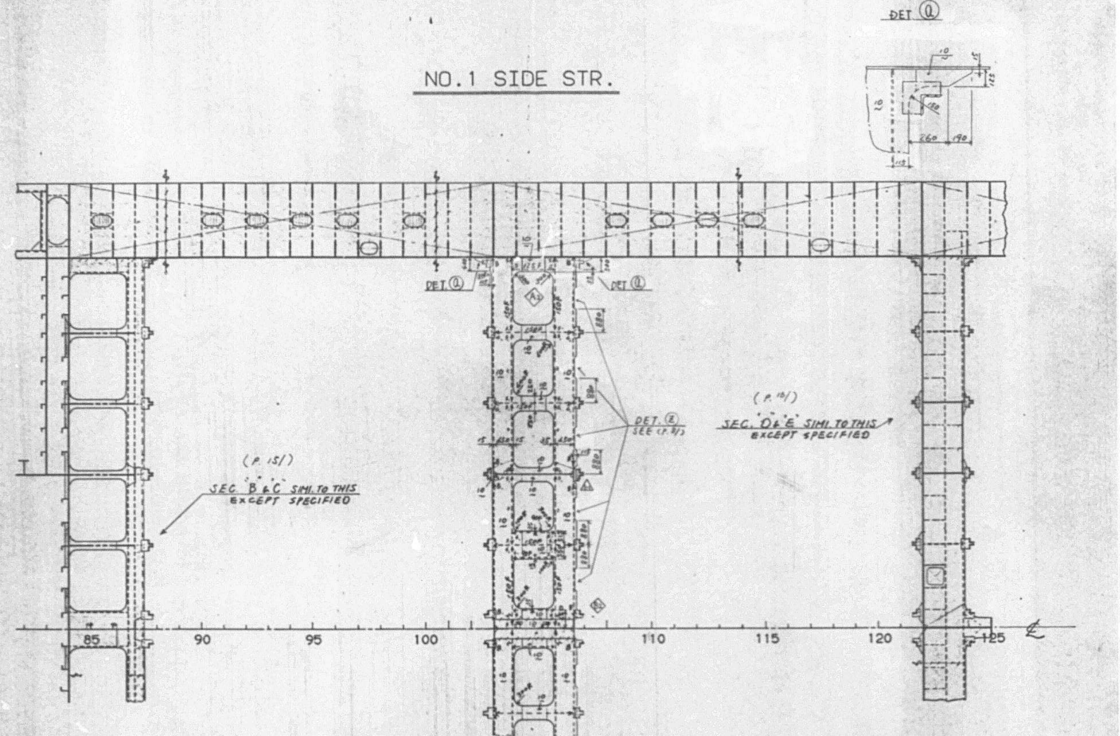
PASSAGE DECK



2107314 - 8/

NO.1 S.STR.

NO.1 SIDE STR.

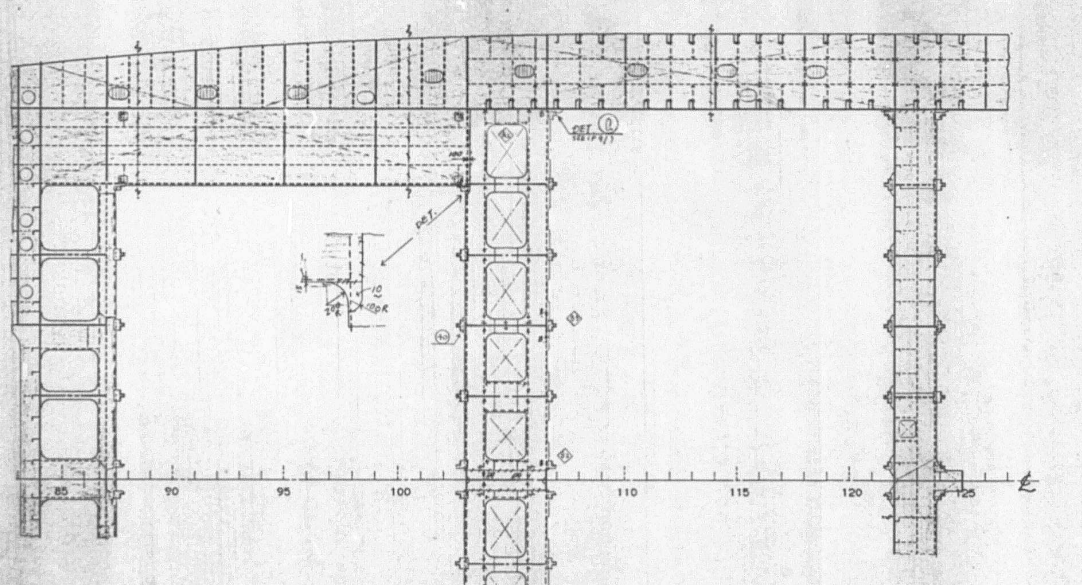


2107314 - 9/

NO.2 S.STR.

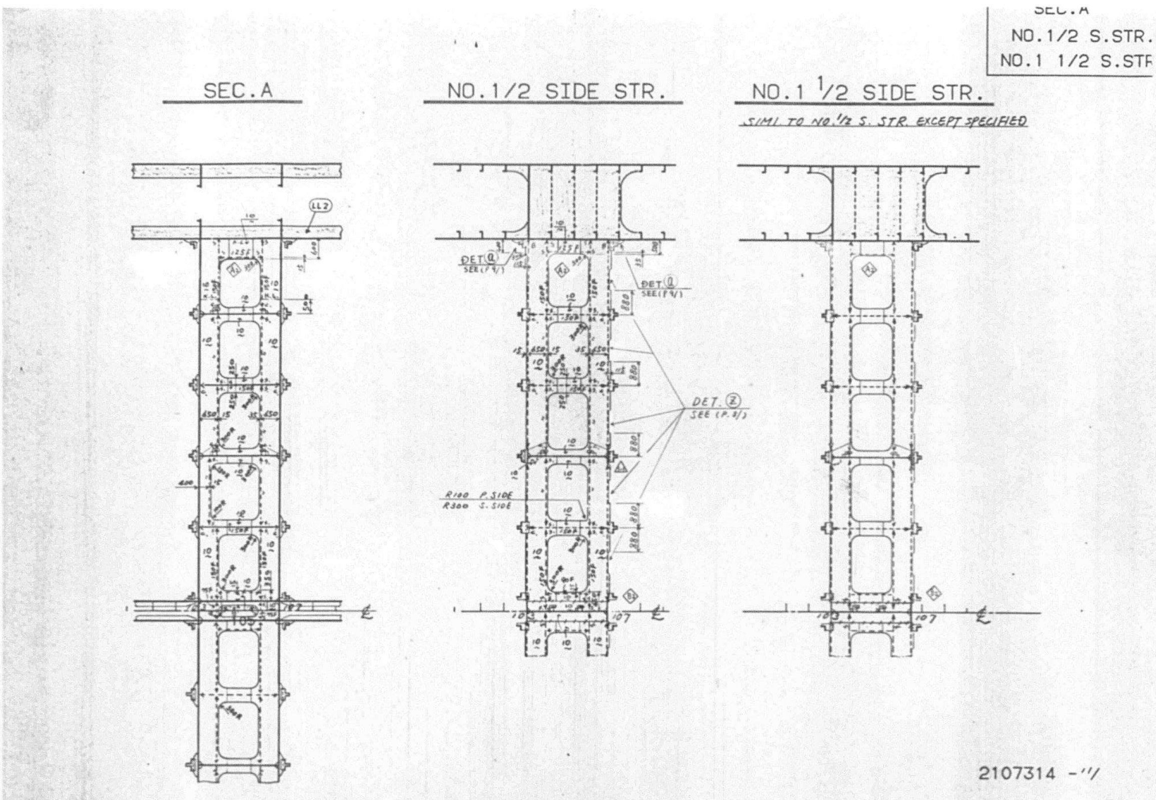
NO.2 SIDE STR.

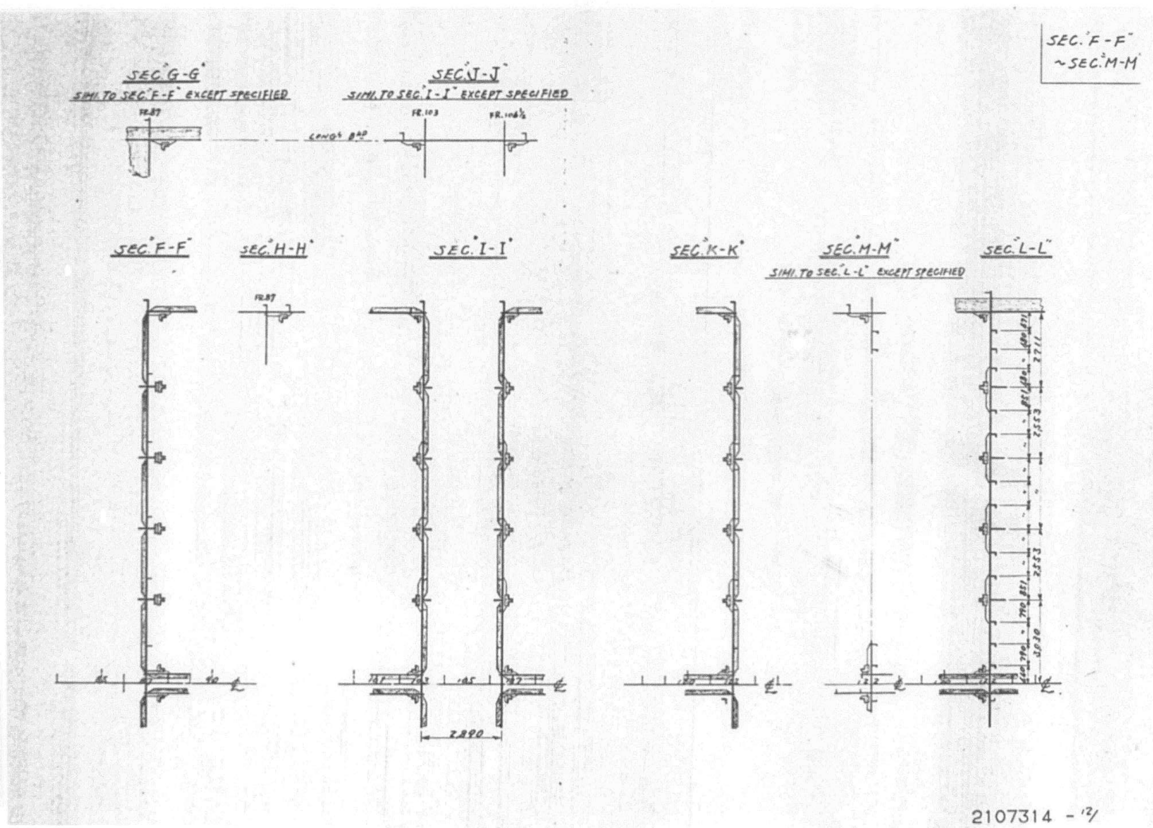
SIMI. TO NO.1 S.STR. EXCEPT SPECIFIED



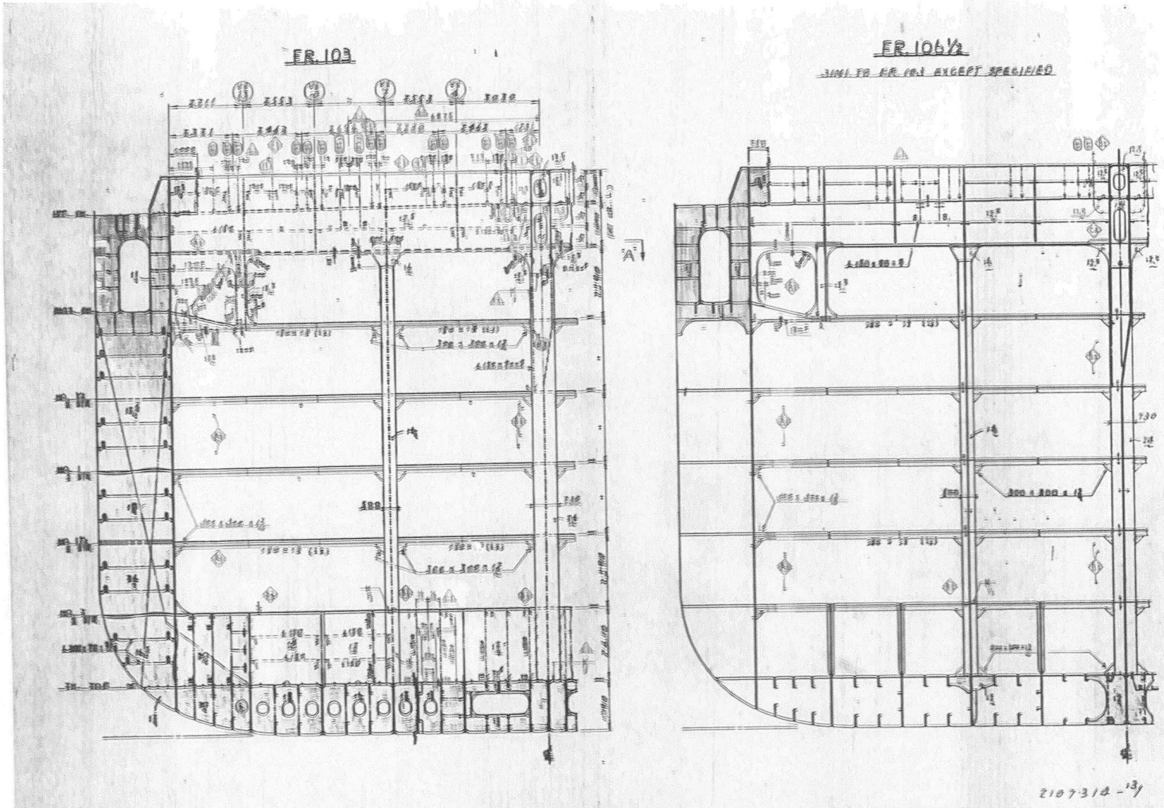
2107314 - 10/

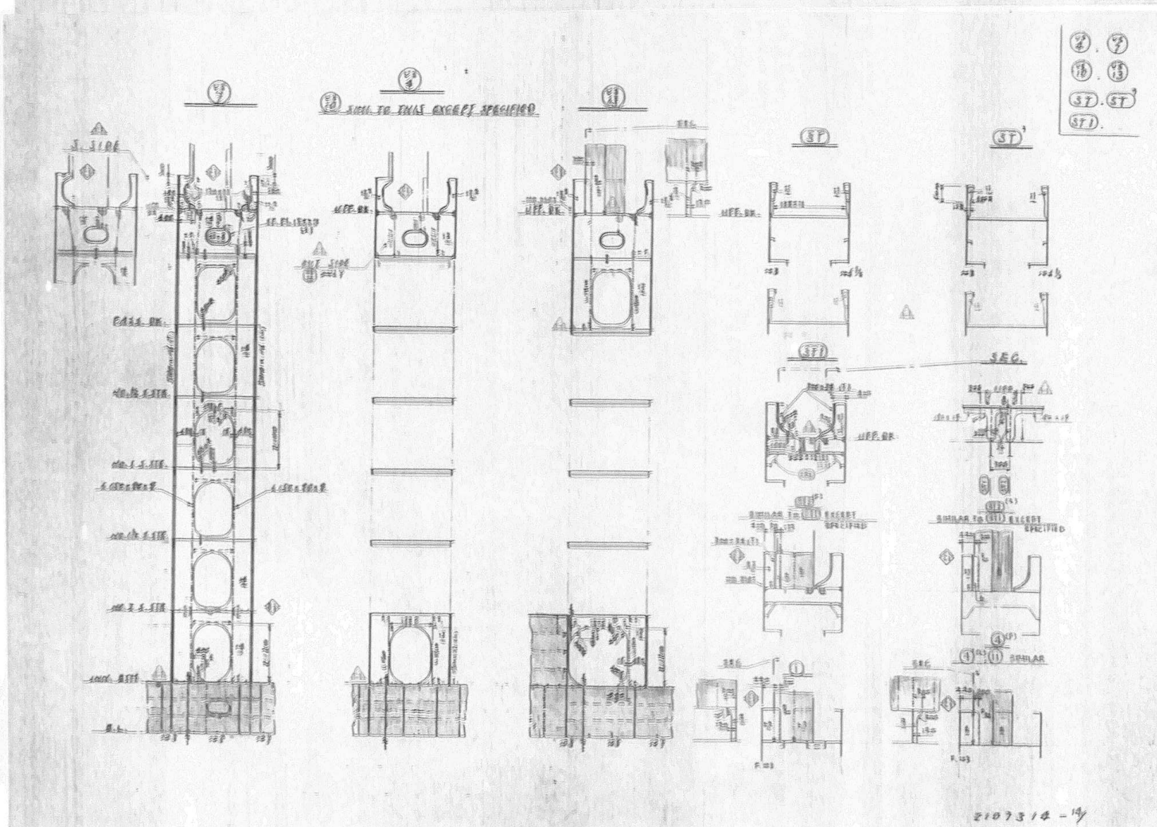
649


SEC.A
NO.1/2 S.STR.
NO.1 1/2 S.STR
SEC.A
NO.1/2 SIDE STR.
NO.1 1/2 SIDE STR.
SIMI. TO NO.1/2 S. STR. EXCEPT SPECIFIED
DET.①
SEE (P.9/1)
DET.②
SEE (P.8/2)
R100 P.SIDE
R300 S.SIDE
2107314 -11

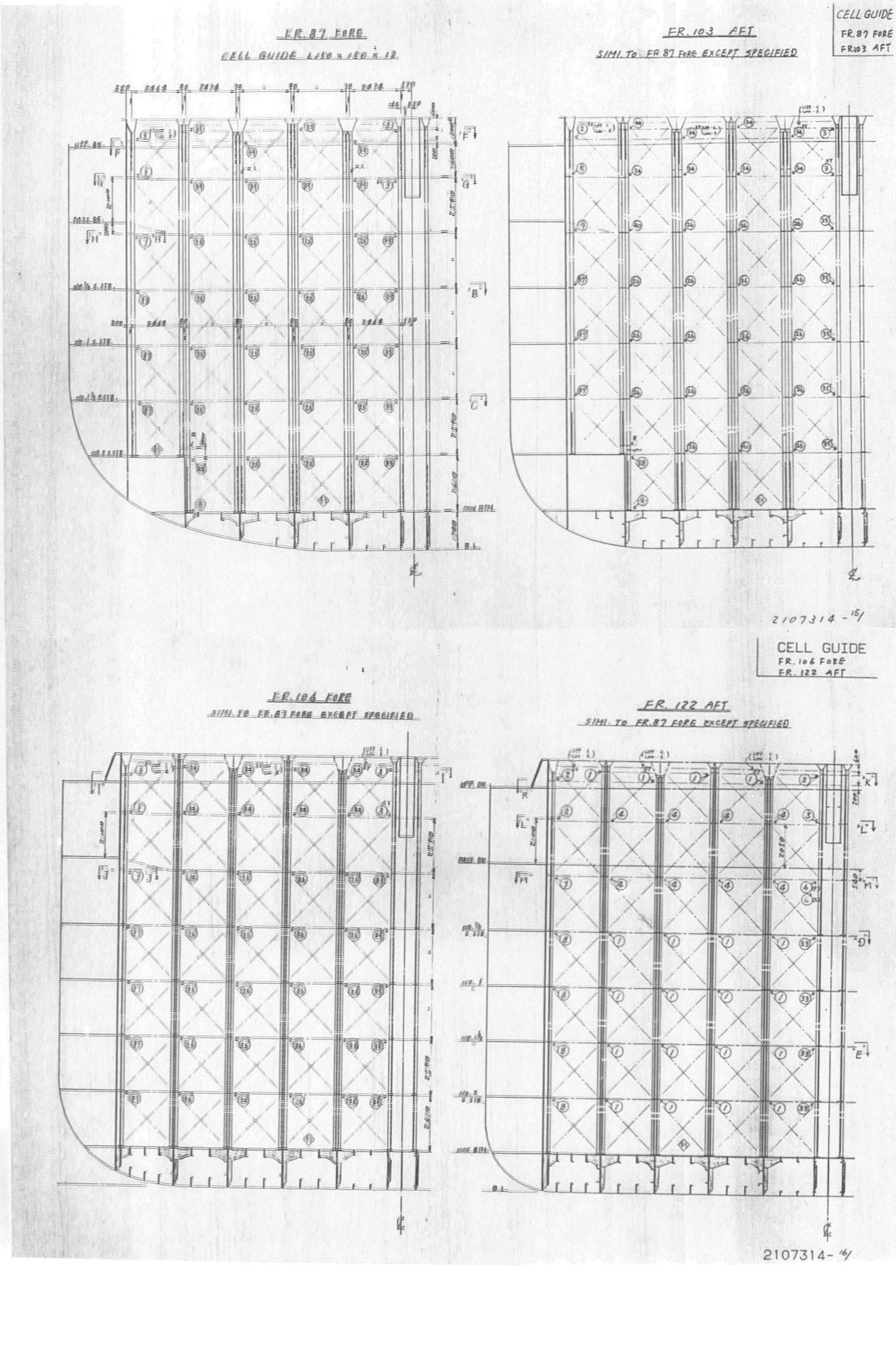

SEC.F-F
~SEC.M-M
SEC.G-G
SIMI. TO SEC.F-F EXCEPT SPECIFIED
SEC.J-J
SIMI. TO SEC.I-I EXCEPT SPECIFIED
SEC.F-F
SEC.H-H
SEC.I-I
SEC.K-K
SEC.M-M
SIMI. TO SEC.L-L EXCEPT SPECIFIED
SEC.L-L
2890
2107314 -12

650





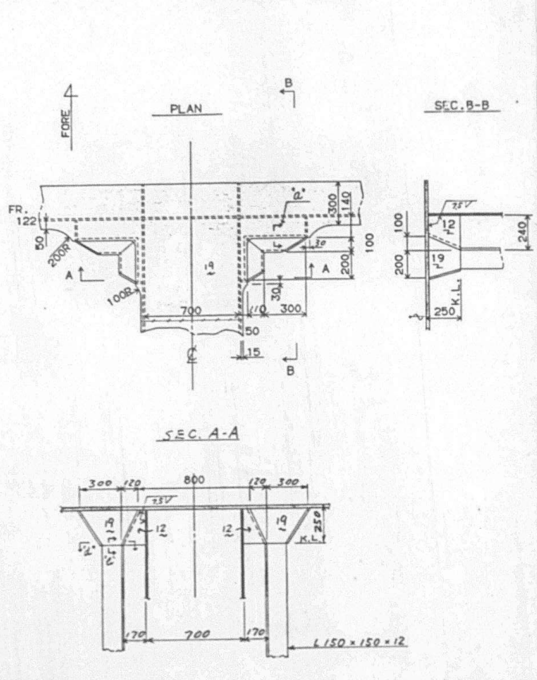
651



CELL GUIDE
FR.87 FORE
FR.103 AFT
FR.87 FORE
CELL GUIDE L150 x 150 x 12
FR.103 AFT
SIMI. TO FR 87 FORE EXCEPT SPECIFIED
2107314 - 15/
CELL GUIDE
FR.106 FORE
FR.122 AFT
FR.106 FORE
SIMI. TO FR.87 FORE EXCEPT SPECIFIED
FR.122 AFT
SIMI. TO FR.87 FORE EXCEPT SPECIFIED
2107314- 16/

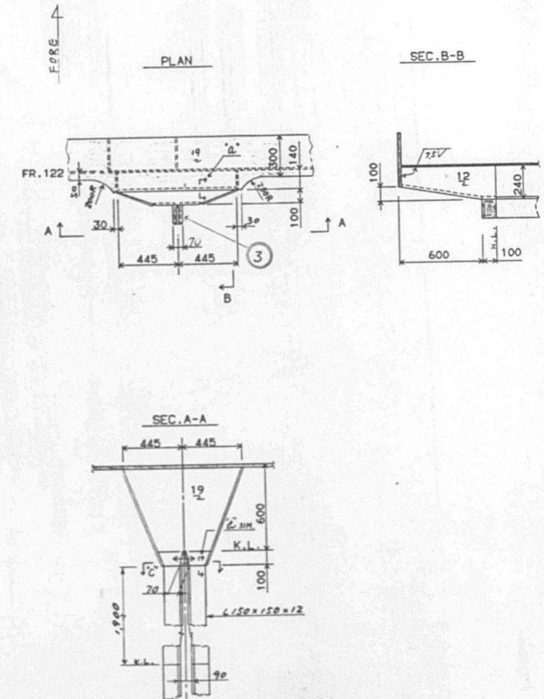
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(EB) ENTRY GUIDE



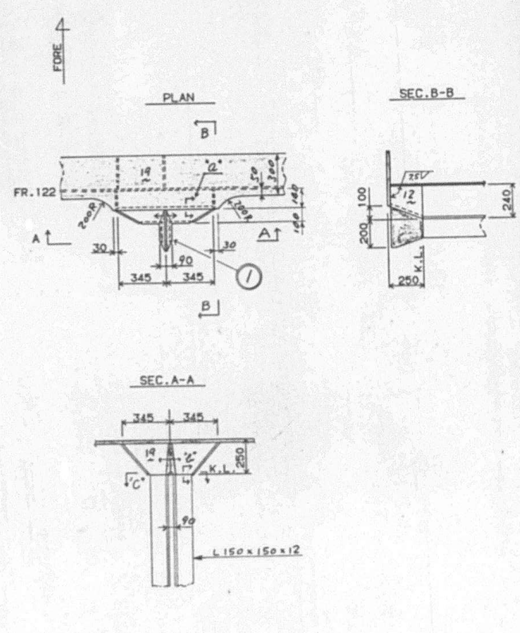
2107314 -17

(EL) ENTRY GUIDE



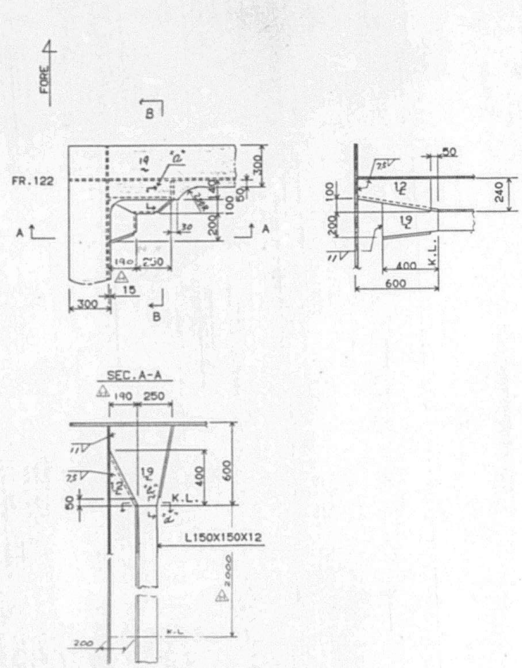
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(EH) ENTRY GUIDE



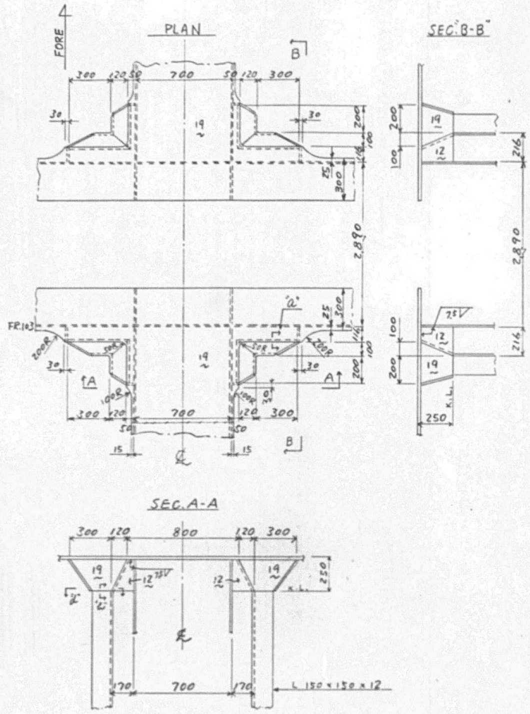
2107314 -19

(EA) ENTRY GUIDE



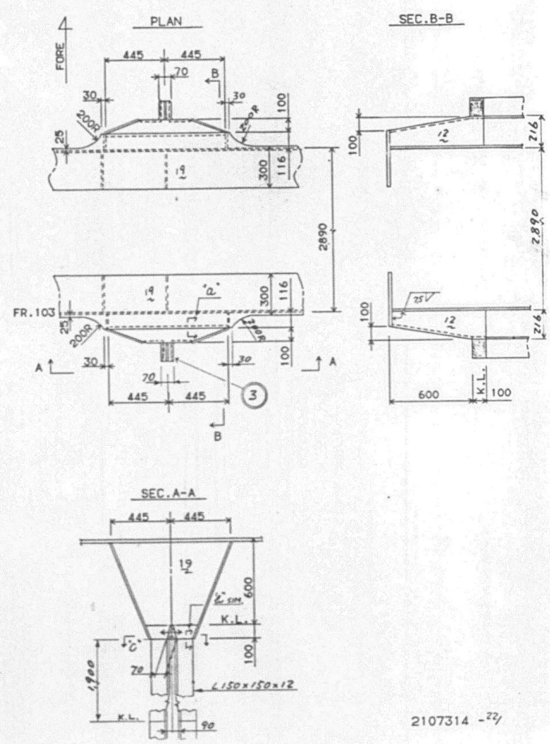
2107314 -20

FB ENTRY GUIDE



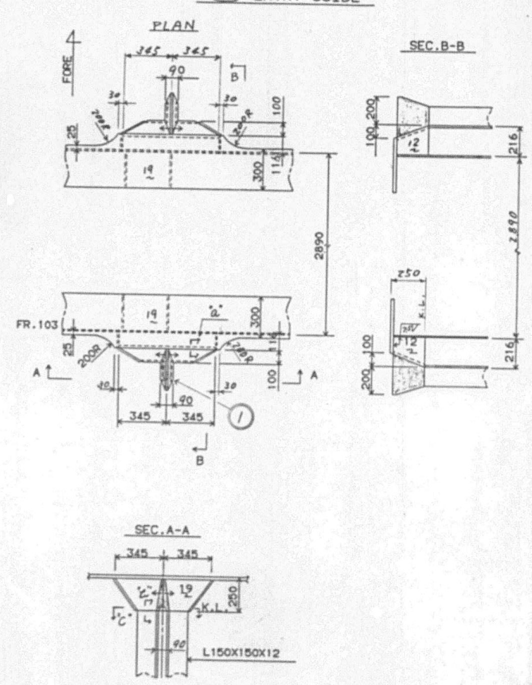
2107314 -21/

FL ENTRY GUIDE



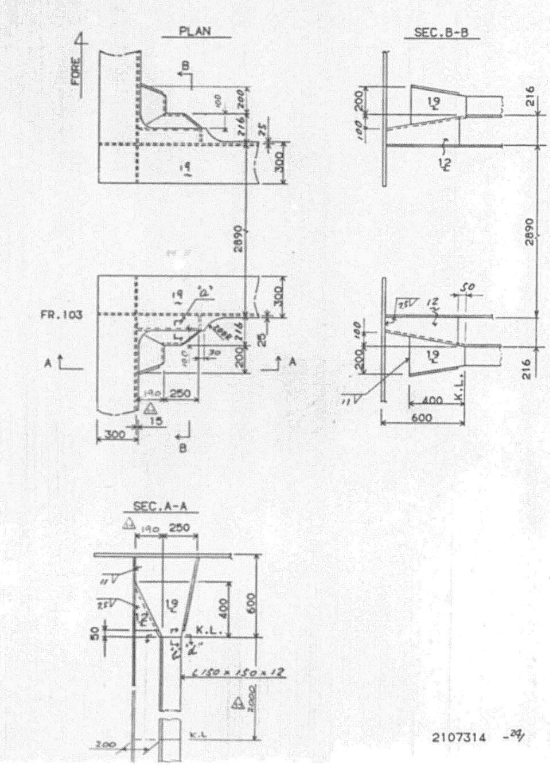
2107314 -22/

FH ENTRY GUIDE



2107314 -23/

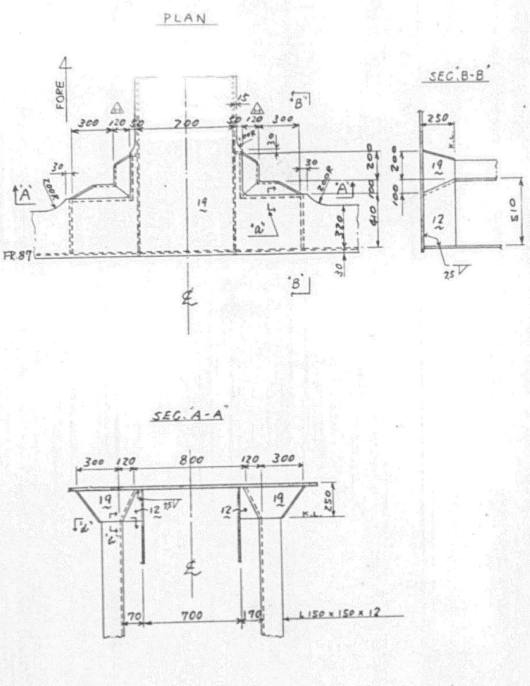
FA ENTRY GUIDE



2107314 -24/

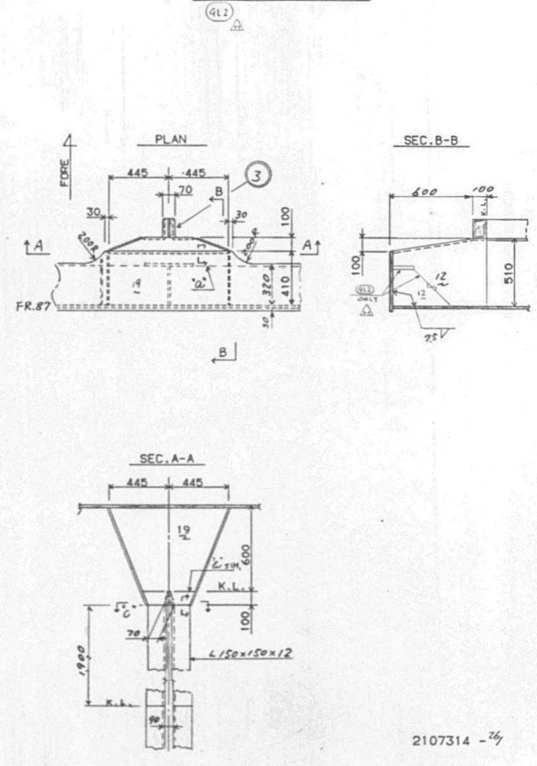
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GB ENTRY GUIDE



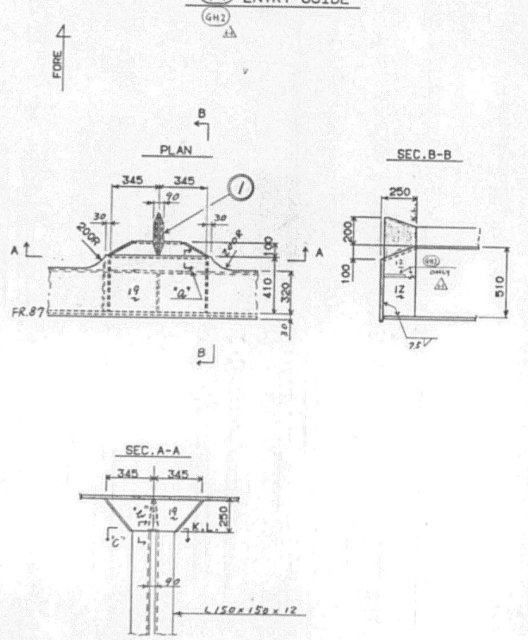
2107314-25

GL ENTRY GUIDE



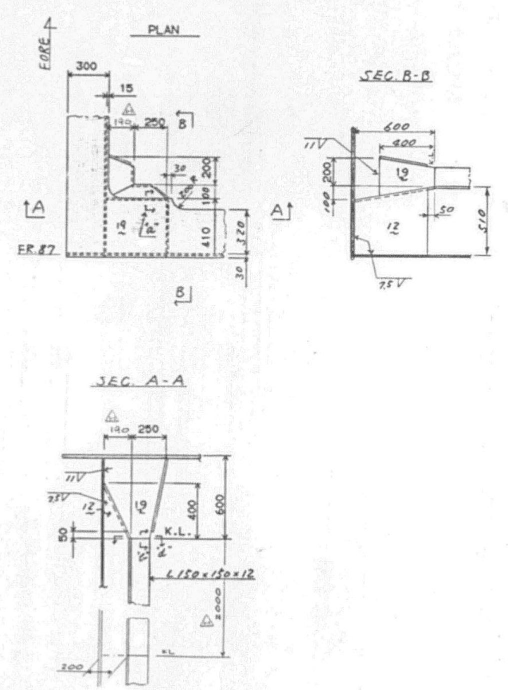
2107314-26

GH ENTRY GUIDE



2107314-27

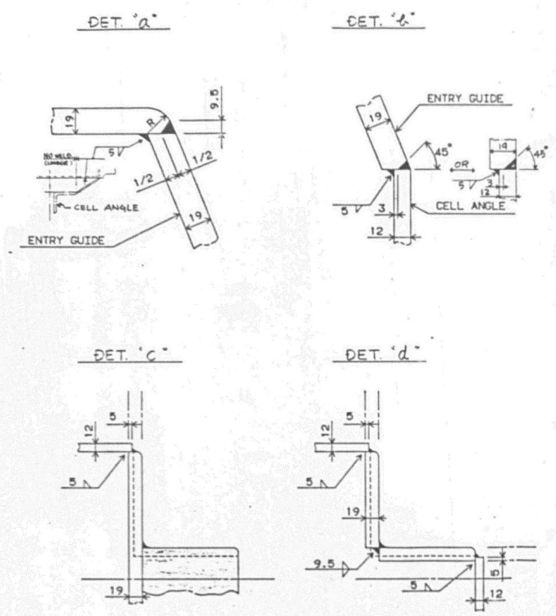
GA ENTRY GUIDE



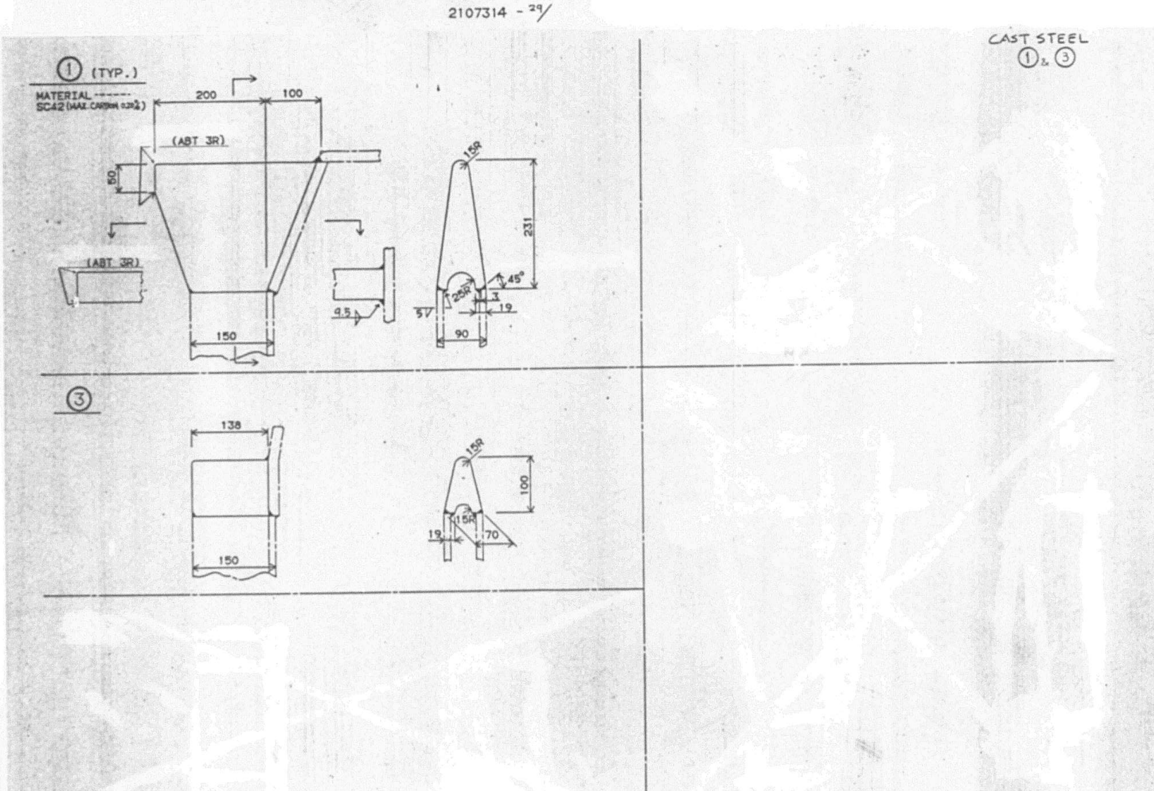
2107314-28

655

DETAIL OF ENTRY GUIDE



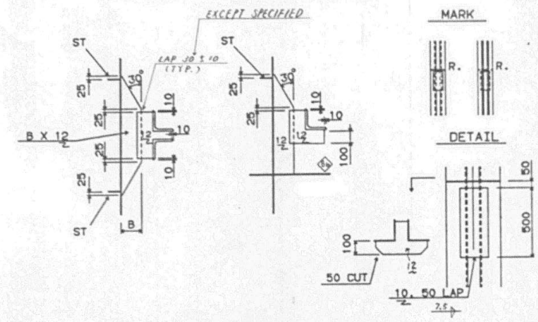
2107314 - 29/



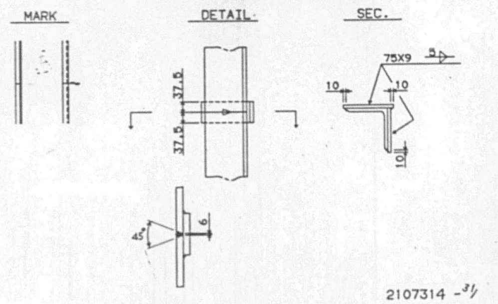
2107314 - 30/

TYPICAL CELL GUIDE RIB

1. WELD.----- 5 ▷ EXCEPT SPECIFIED.
2. LAP WELD---- 10 ▷ EXCEPT SPECIFIED.
3. ST MARK STIFF.---- 90 X 9 F.B. (ST MARK TO BE FITTED.)
   (BOTH ENDS CLIP EXCEPT SPECIFIED)

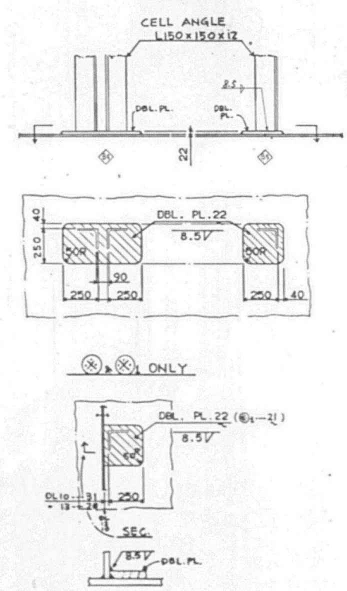


DETAIL OF CELL GUIDE CONNECTION



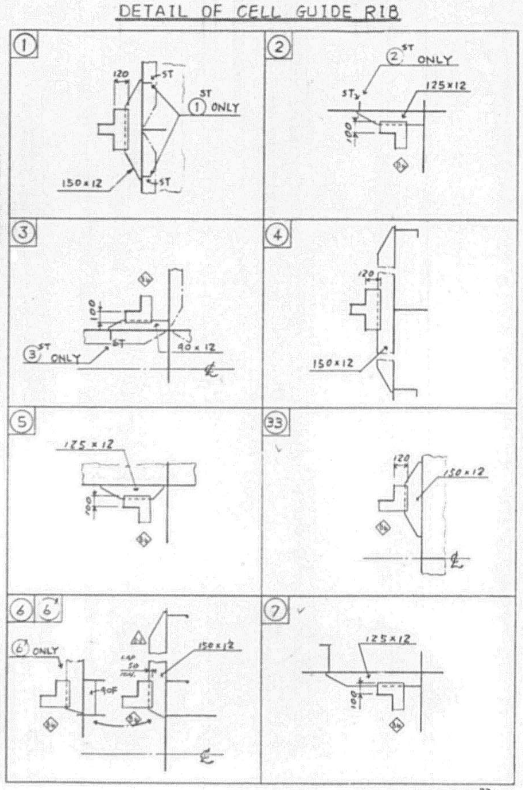
2107314 -31

DETAIL OF LOW. END



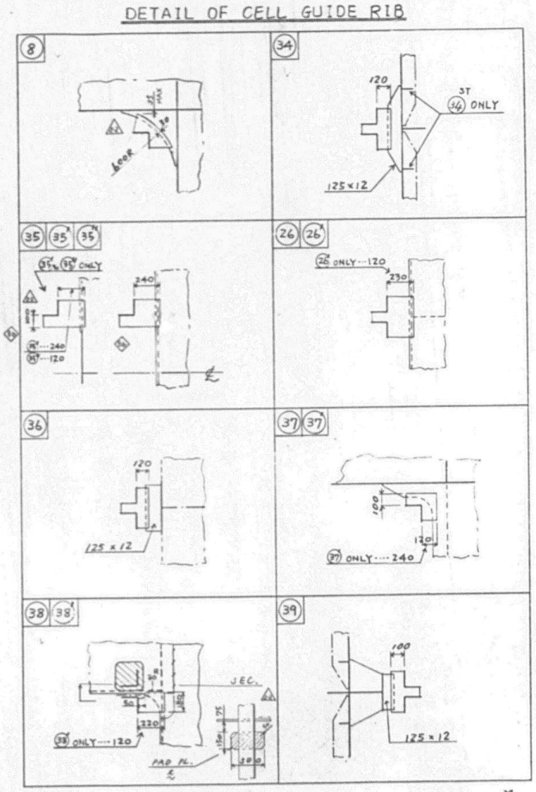
2107314- 32

DETAIL OF CELL GUIDE RIB



2107314 -33

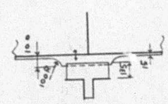
DETAIL OF CELL GUIDE RIB



2107314 -34

DETAIL OF CELL GUIDE RIB

40



Z107314 - 35/35

APPROVAL OF OWNER & REGULATORY BODIES

ALT. NO.	OWNER DATE	OWNER LETTER NO.	USCG DATE	USCG LETTER NO.	ABS DATE	ABS LETTER NO.	USPH DATE	USPH LETTER NO.
ORIGINAL	19 Jun '86	OFTY/MES-471			1 Aug '86	T-8-2		
1ST PART REV	9 Aug '86	OFTY/MES-839			17 SEP '86	T-8-2		
2ND PART REV	23 Jul '86	TAM/24			17 SEP '86	T-8-2		
3RD PART REV	8 SEP '86	TAM/56			9 OCT '86	T-8-2		

PLAN RECORD

ALT. NO.	MARK	ALTERATION/DESCRIPTION	DATE & SIGNATURE
		"PREPARED FOR S.NO. 1323 AS FINISHED PLAN, MADE APPLICABLE TO S.NO. 1324 AND S.NO 1325."	NOV. 28. '86

DWG. NO. 2107315 - 1/

FINISHEDPLAN

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SHIPYARD AND SHIP'S NO. & NAME			
MITSUI TAMANO		MITSUBISHI KOBE	
NO. 1323	DOCTOR LYKES	NO. 1158	JAMES LYKES
NO. 1324	ALMERIA LYKES	NO. 1159	JOSEPH LYKES
NO. 1325	TILLIE LYKES	NO. 1164	SOLON TURMAN

MITSUI ENGINEERING & SHIPBUILDING CO., LTD.
TAMANO WORKS

SHIP DESIGN DEPARTMENT
MANAGER
STRUCTURE DESIGN SEC.
SEC. CHIEF
DATE (TEL 2230)

SHIP'S NO. **1325** SHIP'S NAME **TILLIE LYKES**

コンテナ支持構造（第6倉）
CONT. SUPPORT CONSTRUCTION (No. 6 HOLD)

JOB NO.	SCALE	LYKES REF. NO.	MITSUI DRAWING NO.
TS1323/24/25. JOB CLASSIF. NO. B.07	1/100	120507	2107315

(25 SHEETS WITH COVER)

NOTES:-

1. BOTH SIDES TO BE SYMMETRICAL EXCEPT SPECIFIED.
2. TRANS. SECTIONS TO BE "LOOKING FORE" EXCEPT SPECIFIED.
3. REFER TO "CONSTRUCTION DETAILS (DWG NO. 2100811)" FOR STRUCTURAL DETAILS OF MEMBERS, ETC. EXCEPT SPECIFIED.
4. REFER TO "WELDING TABLE (DWG. NO. 2100832)" FOR LEG LENGTH OF WELDING EXCEPT SPECIFIED.

備考:-

1. 特記の他は，両舷対称とする。
2. 横断面図は，特記の他は後面を示す。
3. 構造詳細については，特記の他は「構造詳細図（図番2100811）」を参照のこと。
4. 溶接脚長については，特記の他は「溶接脚長表（図番2100832）」を参照のこと。

2107315 - 2/

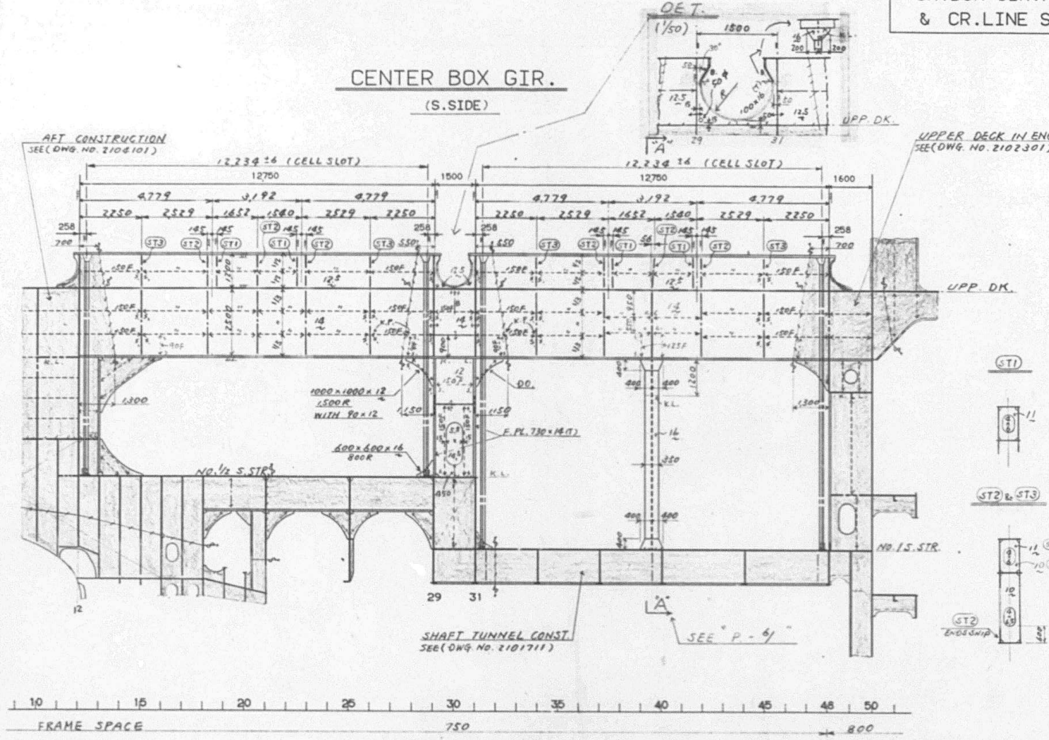
MATERIAL LIST

	ITEM	MTERIAL	NO.	WT(TON) (ABT)	SHOP	ARR. NO.
1	ENTRY GUIDE	(STEEL CASTING) SC42 (MAX CARBON 0.20%)	16		1,船工	—
2	"	"	16		1,船工	—
3	"	"	16		1,船工	—
4	"	"	8		"	—
5	"	"	8		"	—

INFORMATION FOR MES ONLY

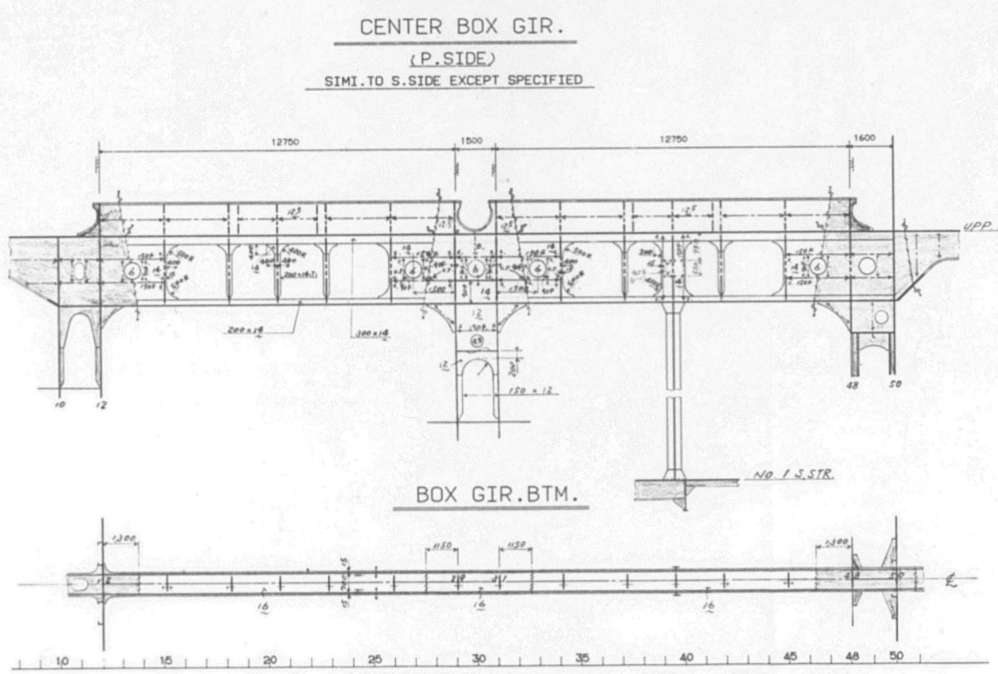
2107315 - 3/

CR.BOX GIR.(S.SIDE)
& CR.LINE SEC.

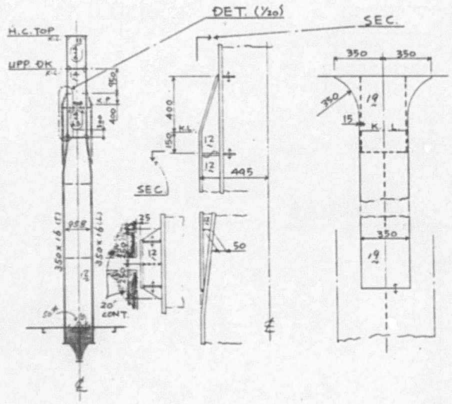


2107315 - 4/

CR.BOX GIR.(P.SIDE)
BOX GIR.BTM.



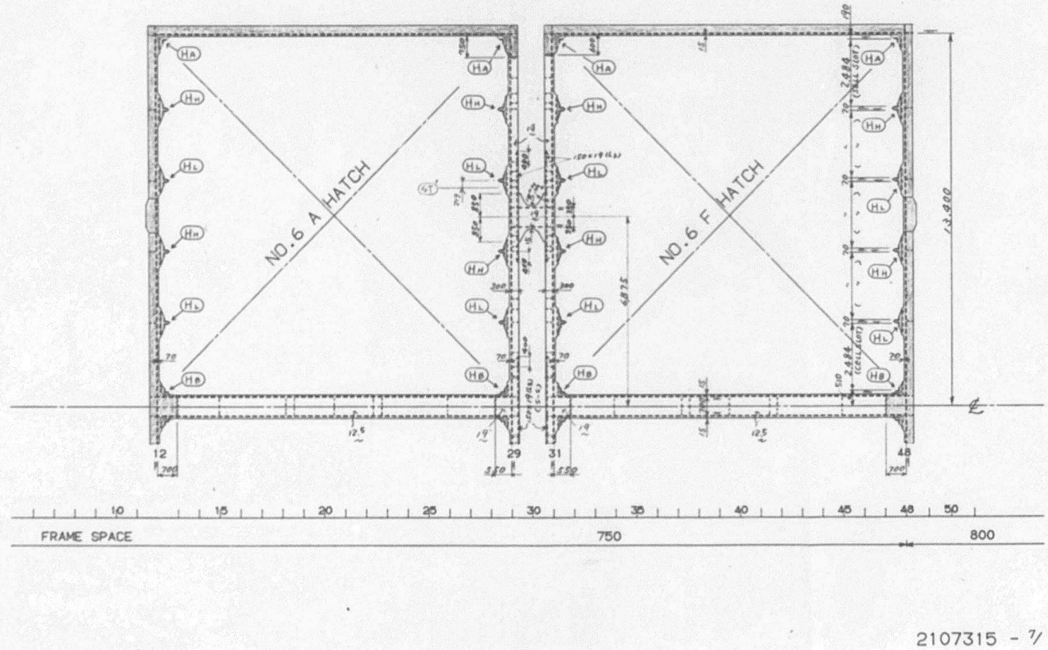
2107315 - 5/



2107315 - 6/

HATCH COAM. TOP PLAN

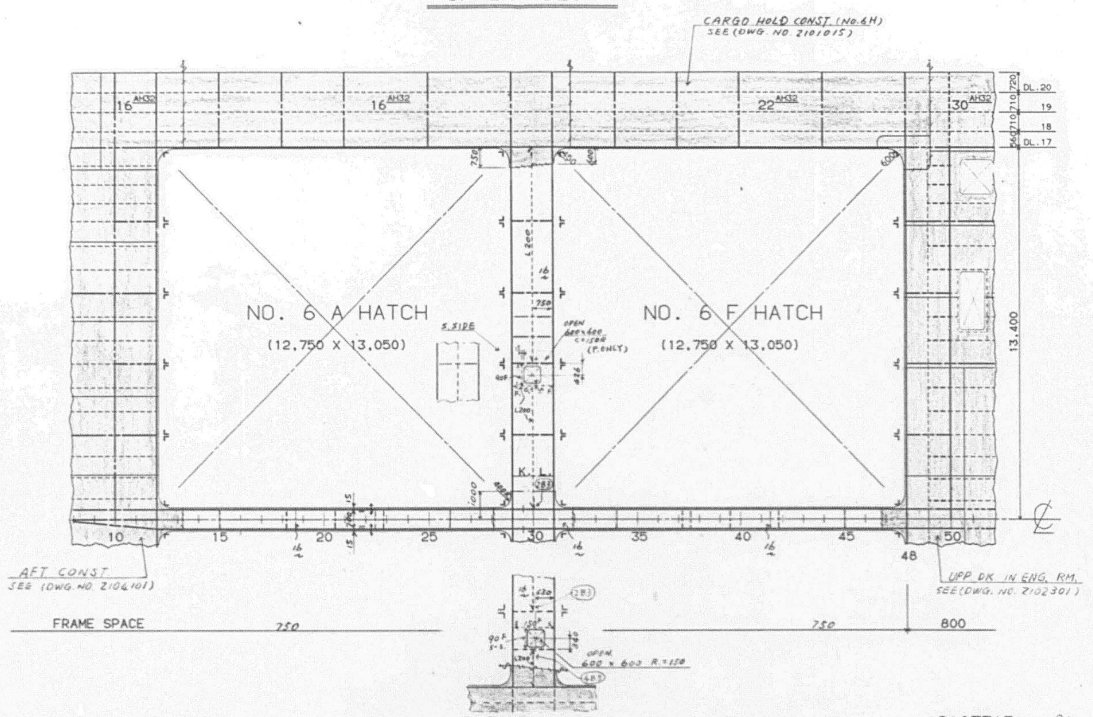
NO.6 HOLD



2107315 - 7/

UPP.DK.

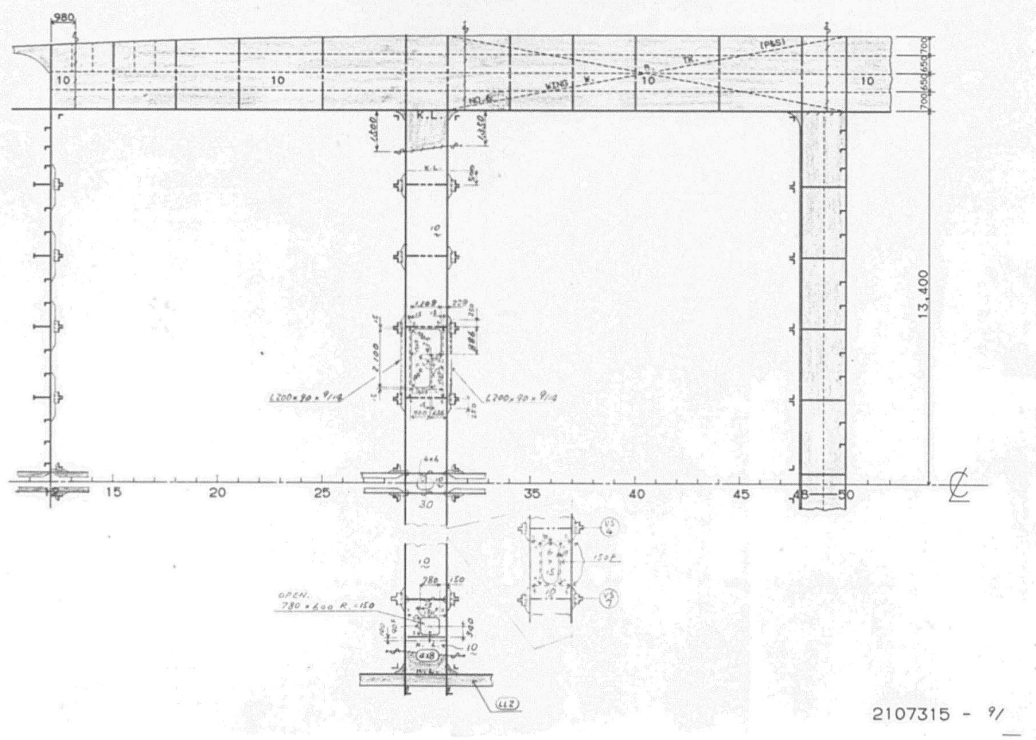
UPPER DECK



2107315 - 8/

PASSAGE DECK

PASSAGE DECK

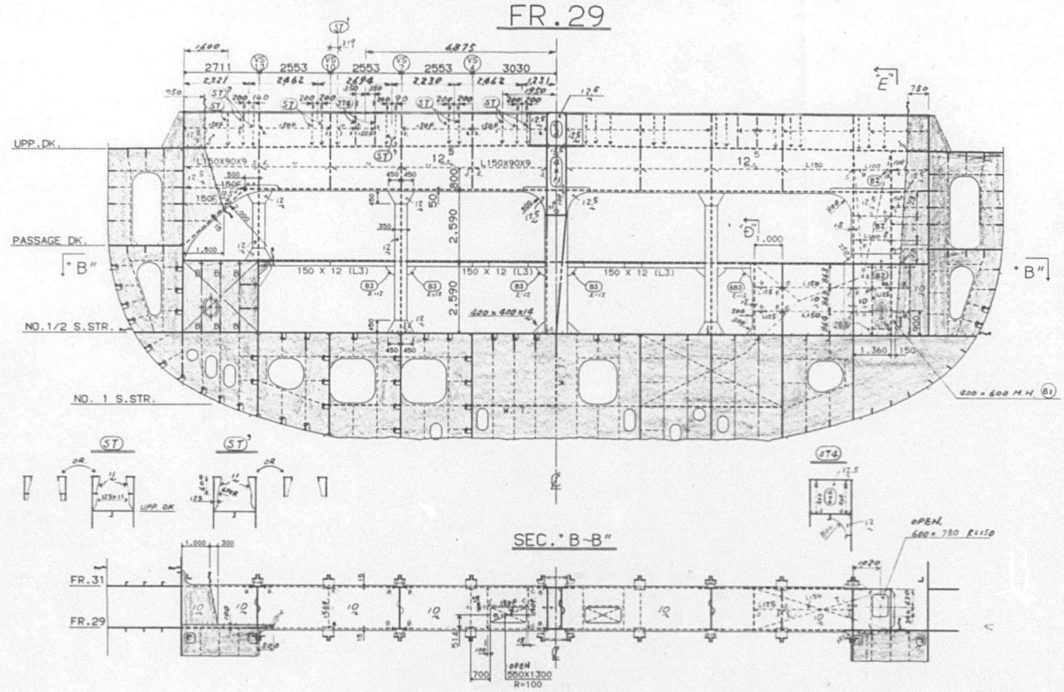


2107315 - 9/

662

FR.29

FR.29

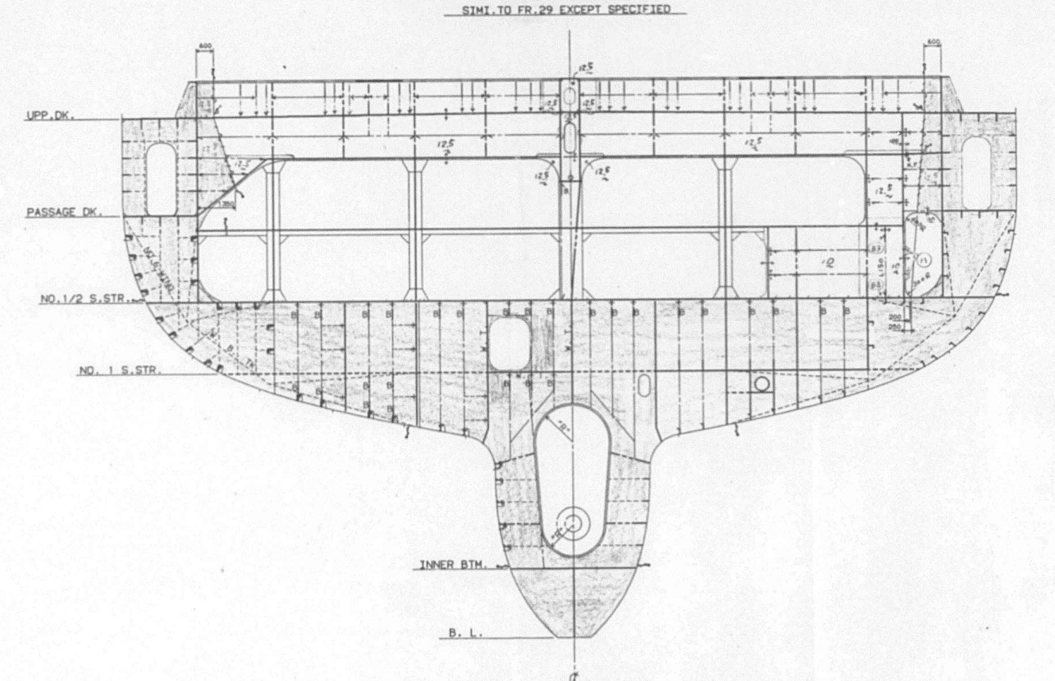


2107315 -10/

FR.31

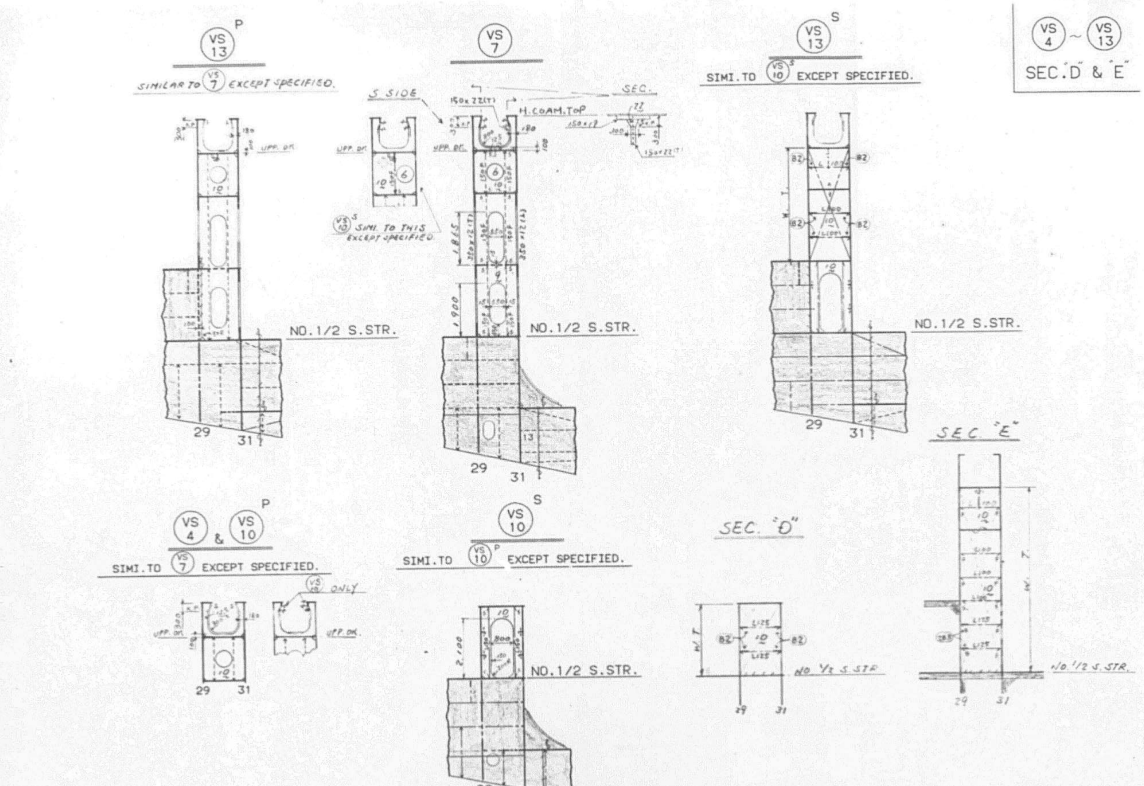
FR.31

SIMI. TO FR.29 EXCEPT SPECIFIED



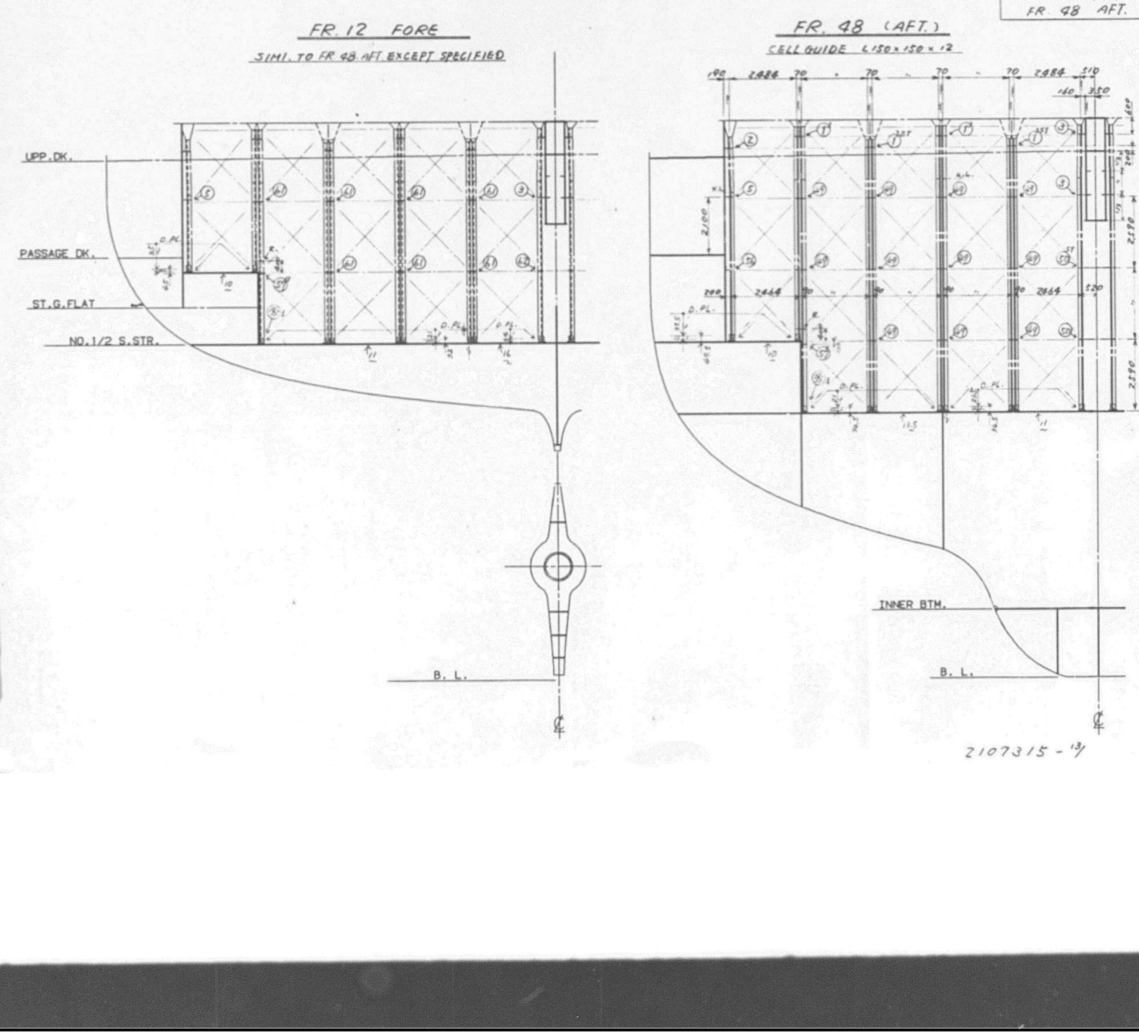
2107315 -11/

663



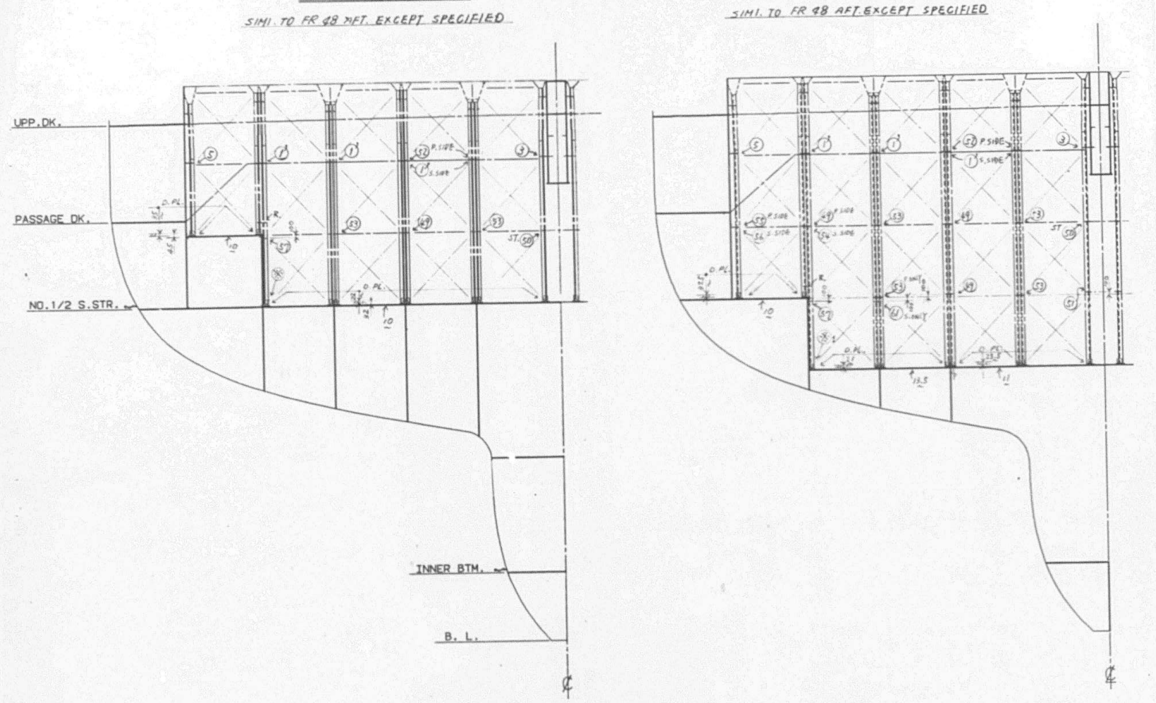
2107315 - 12/

CELL GUIDE
FR 12 FORE
FR 48 AFT.

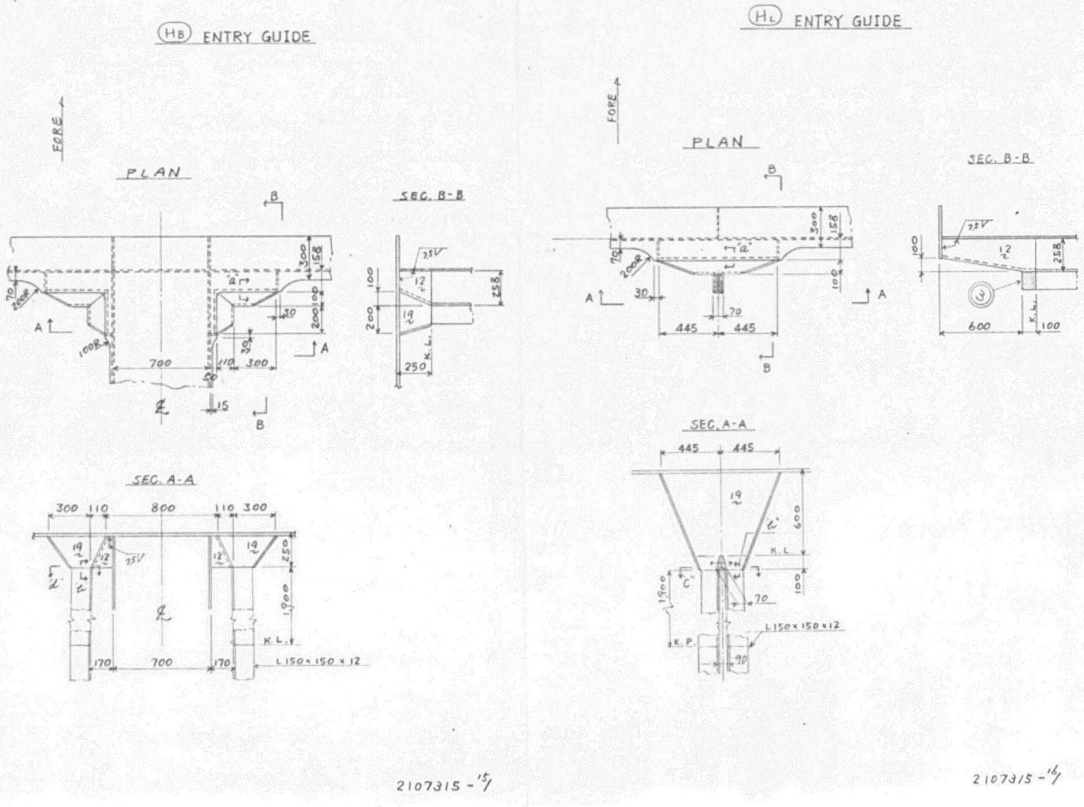


2107315 - 13/

CELL GUIDE
FR 29 AFT.
FR 31 FORE



2107315 - 14/

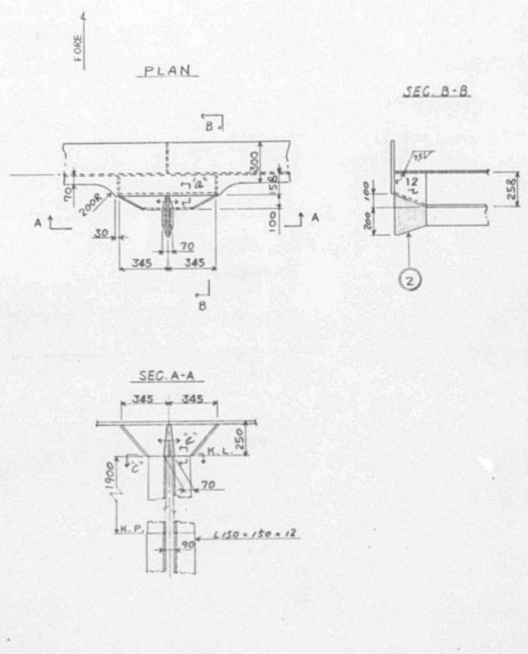


2107315 - 15/

2107315 - 16/

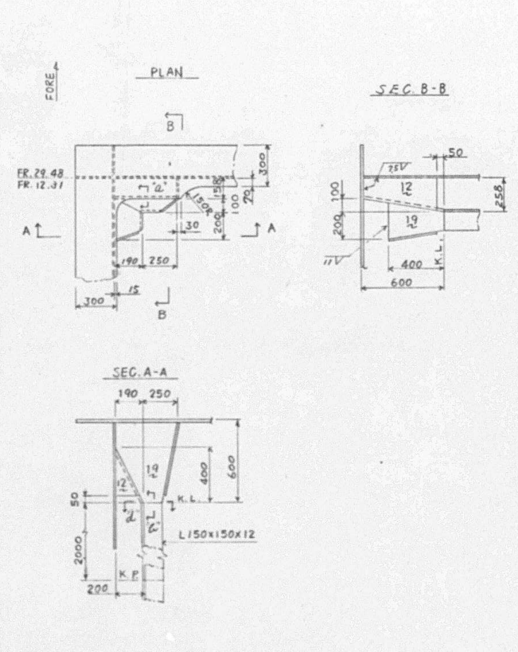
665

(HH) ENTRY GUIDE



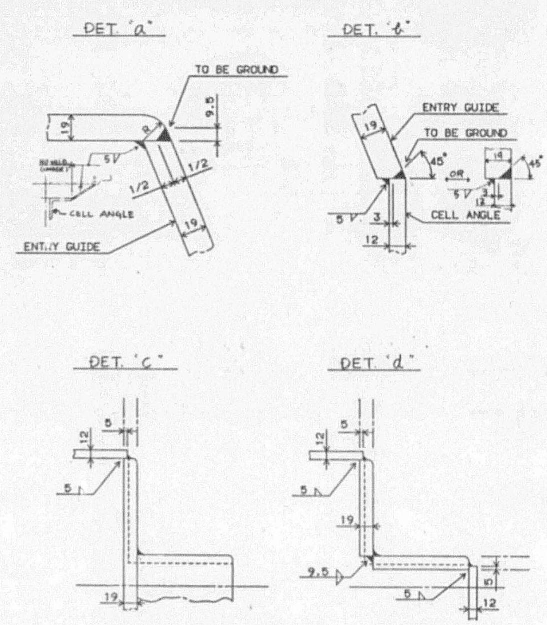
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(HA) ENTRY GUIDE



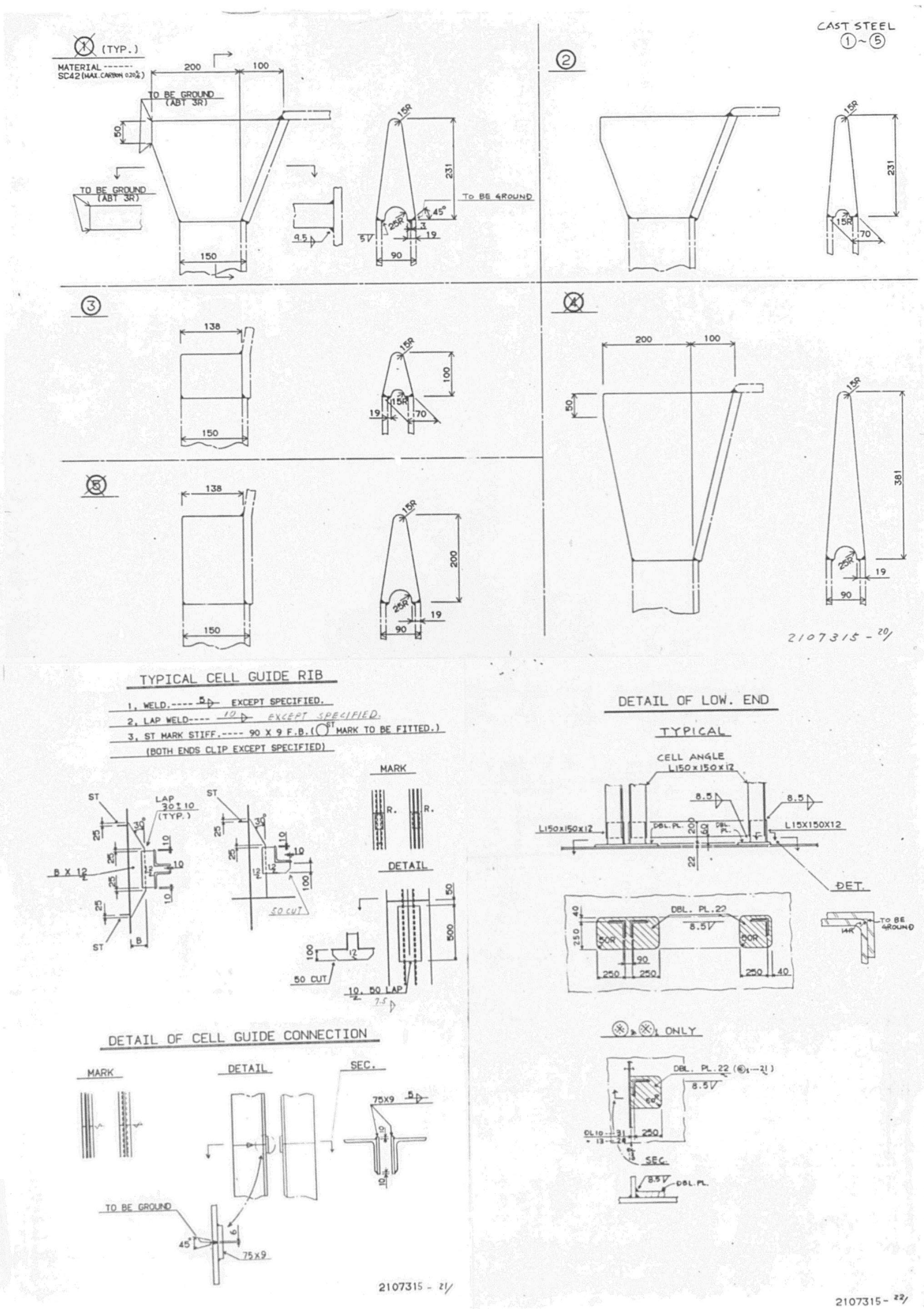
2107315 - 18/

DETAIL OF ENTRY GUIDE

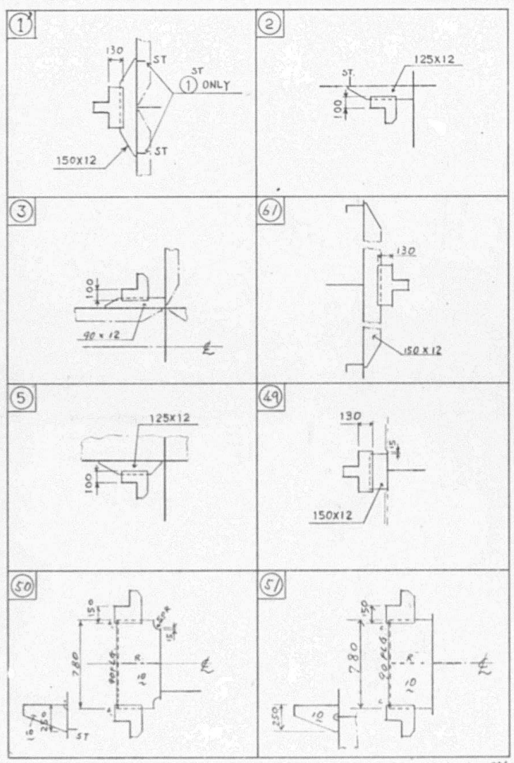


2107315 - 19/

666

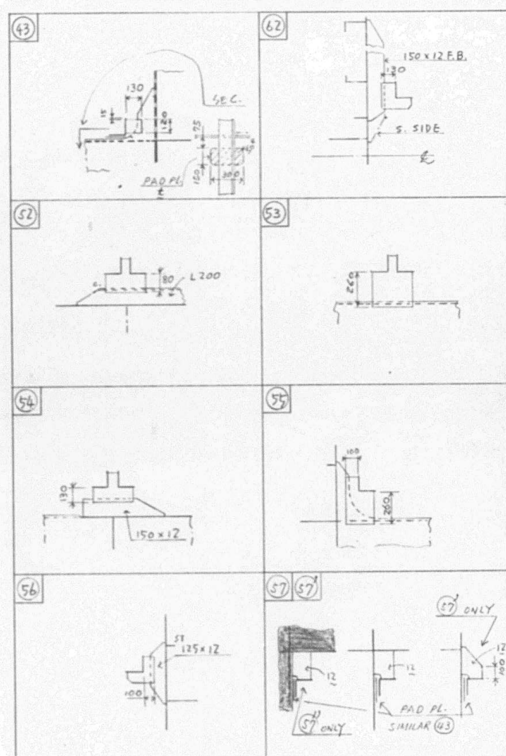

CAST STEEL ①~⑤
(TYP.)
MATERIAL ------ SC42 (MAX. CARBON 0.20%)
TO BE GROUND (ABT 3R)
TO BE 4ROUND
②
③
④
⑤
2107315 - 20/
TYPICAL CELL GUIDE RIB
1. WELD.---- 5 EXCEPT SPECIFIED.
2. LAP WELD---- 10 EXCEPT SPECIFIED.
3. ST MARK STIFF.---- 90 X 9 F.B. (ST MARK TO BE FITTED.)
(BOTH ENDS CLIP EXCEPT SPECIFIED)
LAP 30±10 (TYP.)
MARK
DETAIL
50 CUT
10. 50 LAP
DETAIL OF CELL GUIDE CONNECTION
SEC.
75X9
TO BE GROUND
2107315 - 21/
DETAIL OF LOW. END
TYPICAL
CELL ANGLE L150x150x12
DBL. PL.
L15X150X12
DET.
DBL. PL.22
TO BE GROUND
ONLY
DBL. PL.22
SEC.
DBL. PL.
2107315 - 22/

DETAIL OF CELL GUIDE RIB



2107315 - 23/

DETAIL OF CELL GUIDE RIB



2107315 - 24/24

PLAN RECORD BY MHI

ALT. NO.	MARK	DESCRIPTION	DATE	BY
ORIG.		FOLLOWED MES ORIGINAL PLAN.	MAY. 16 '85	
-10	A	SUBMITTED FOR APPROVAL OF OWNER & ABS PREPARED TO MODIFICATION FOR MHI BUILDING SHIPS. 1. REARRANGED BLOCK BUTT JOINTS ON CENTER LINE LONGITUDINAL BOX GIRDER. 2. DELETED BLOCK BUTT JOINTS & SEAM JOINTS ON CENTER LINE LONGL BOX GIRDER. 3. SHIFTED BLOCK BUTT JOINTS ON HORIZONTAL GIRDER & TRANS WEB OF CONTAINER SUPPORT CONSTRUCTION IN WAY OF LONGL BULKHEAD. 4. ADDED BLOCK BUTT JOINTS ON TRANS BOX GIRDER OF CONTAINER SUPPORT CONSTRUCTION IN WAY OF C.L. LONGL BOX GIRDER. 5. DELETED ADJUSTING PIECES OF LOWER END OF CELL GUIDE. 6. MODIFIED SHAPE OF CELL GUIDE RIBS. 7. PENETRATED C.L. VERT. WEB (P-SIDE) AT HORIZONTAL GIRDER IN SEC. "B~B". 8. ADDED INSERT PLATES ON HORIL GIRDER (SEC. B~B) 9. REARRANGED BUTT JOINTS ON TRANS WEB OF CONTAINER SUPPORT CONSTRUCTION. 10. MODIFIED TYPE OF HATCH END COAMING STAY FROM TYPE (S1) TO TYPE (S1). BASED DWG MES DWG NO. 2107315 (INCL. PARTLY REVISED PLAN NO. 1 & 2)	AUG. 5, '85	
-11		FOLLOWED MES PARTLY REVISED PLAN NO. 3	AUG. 13, '85	
-F	—	PREPARED AS FINISHED PLAN FOR S. No. 1158	MAR. 11, '87	

26 SHEETS WITH COVER

CON-FERRED	SHIP DESIGNING DEPARTMENT HULL DESIGNING SECTION	
	APPROVED T. Hirayama / H. Okawa	CLASS ABS
	CHECKED S. Furuhashi	コンテナ支持構造（第6倉） CONT. SUPPORT CONSTRUCTION (No. 6 HOLD)
	DRAWN	
	SCALE	
	ORDER 01-15800	ITEM / DRAWING NO. HS-19450-F / LYKES REF. NO. 120507

MITSUBISHI HEAVY INDUSTRIES, LTD.
KOBE SHIPYARD & ENGINE WORKS

APPROVAL OF OWNER & REGULATORY BODIES

ALT. NO.	OWNER DATE	OWNER LETTER NO.	USCG DATE	USCG LETTER NO.	ABS DATE	ABS LETTER NO.	USPH DATE	USPH LETTER NO.
ORIGINAL								
PART. REV. PLAN NO. 1	11-JUN '85							
PART. REV. PLAN NO. 2	23-JUL '85	TAM/24						

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SHIPYARD AND SHIP'S NO. & NAME

MITSUI TAMANO		MITSUBISHI KOBE	
NO. 1323	DOCTOR LYKES	NO. 1158	JAMES LYKES
NO. 1324	ALMERIA LYKES	NO. 1159	JOSEPH LYKES
NO. 1325	TILLIE LYKES	NO. 1164	SOLON TURMAN

MITSUI ENGINEERING & SHIPBUILDING CO., LTD.
TAMANO WORKS

SHIP DESIGN DEPARTMENT MANAGER / SHIP'S NO. / SHIP'S NAME

STRUCTURE DESIGN SEC. — PARTLY REVISED PLAN NO. 3
SEC. CHIEF N. Yamamoto
ASSIST CHIEF
CHARGE ENG'R
STAFF
DATE 60-8-7 (TEL. 2230)
JOB NO. TS1323/24/25

コンテナ支持構造（第6倉）
CONT. SUPPORT CONSTRUCTION (No. 6 HOLD)

SCALE 1/100 | LYKES REF. NO. 120507 | MITSUI DRAWING NO. 2107315-3

(3 SHEETS WITH COVER)

0-2/

PLAN RECORD

ALT. NO.	MARK	ALTERATION/DESCRIPTION	DATE & SIGNATURE
ORIGINAL		PREPARED FOR APPROVAL OF OWNER & ABS	MARCH. 26. '85
1	1-1	DESIGN DEVELOPMENT & OWNER'S COMMENT	JUL. 1. '85
	1-2	MISCELLANEOUS REVISION (DESIGN DEVELOPMENT)	
2	2	MISCELLANEOUS RIVISION (DESIGN DEVELOPMENT)	JUL. 9 '85 H.Y
3	3	MISCELLANEOUS RIVISION (DESIGN DEVELOPMENT)	JUL. 26 '85 H.Y

DWG. NO. 2107315-3/

NOTES:-

1. BOTH SIDES TO BE SYMMETRICAL EXCEPT SPECIFIED.
2. TRANS. SECTIONS TO BE "LOOKING FORE" EXCEPT SPECIFIED.
3. REFER TO "CONSTRUCTION DETAILS (DWG NO. 2100811)" FOR STRUCTURAL DETAILS OF MEMBERS, ETC. EXCEPT SPECIFIED.
4. REFER TO "WELDING TABLE (DWG. NO. 2100832)" FOR LEG LENGTH OF WELDING EXCEPT SPECIFIED.

備 考:-

1. 特記の他は，両舷対称とする。
2. 横断面図は，特記の他は後面を示す。
3. 構造詳細については，特記の他は「構造詳細図（図番 2100811）」を参照のこと。
4. 溶接脚長については，特記の他は「溶接脚長表（図番 2100832）」を参照のこと。

2107315-2/

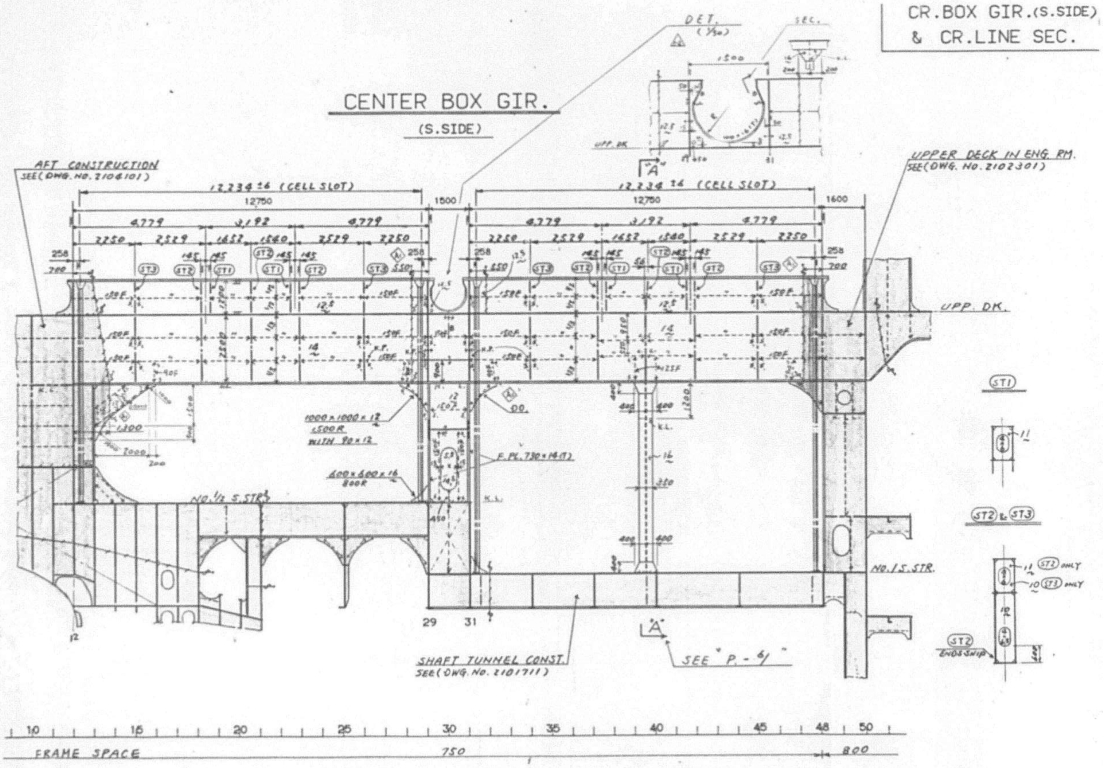
669

MATERIAL LIST

	ITEM	MTERIAL	NO	WT(TON) (ABT)
②	ENTRY GUIDE	(STEEL CASTING) SC42 (MAX CARBON 0.20%)	16	
③	"	"	16	

2107315 - 3/

CR.BOX GIR.(S.SIDE) & CR.LINE SEC.



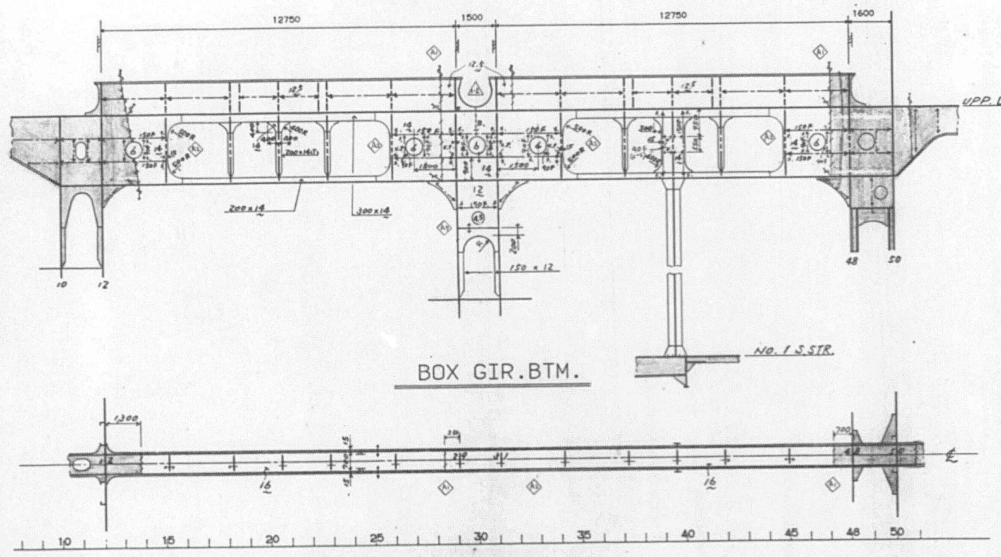
2107315 - 4/

CR.BOX GIR.(P.SIDE)
BOX GIR.BTM.

CENTER BOX GIR.

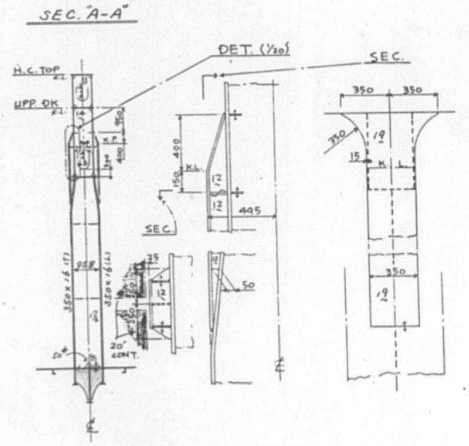
(P.SIDE)

SIMI. TO S.SIDE EXCEPT SPECIFIED



2107315 - 5/

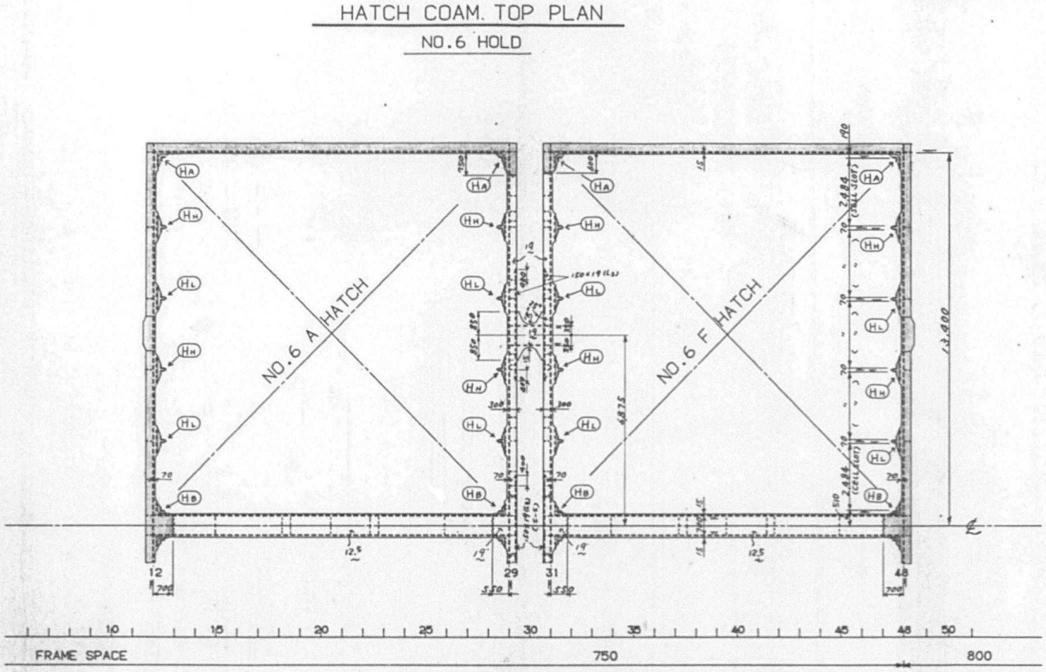
SEC. "A-A"



2107315 - 6/

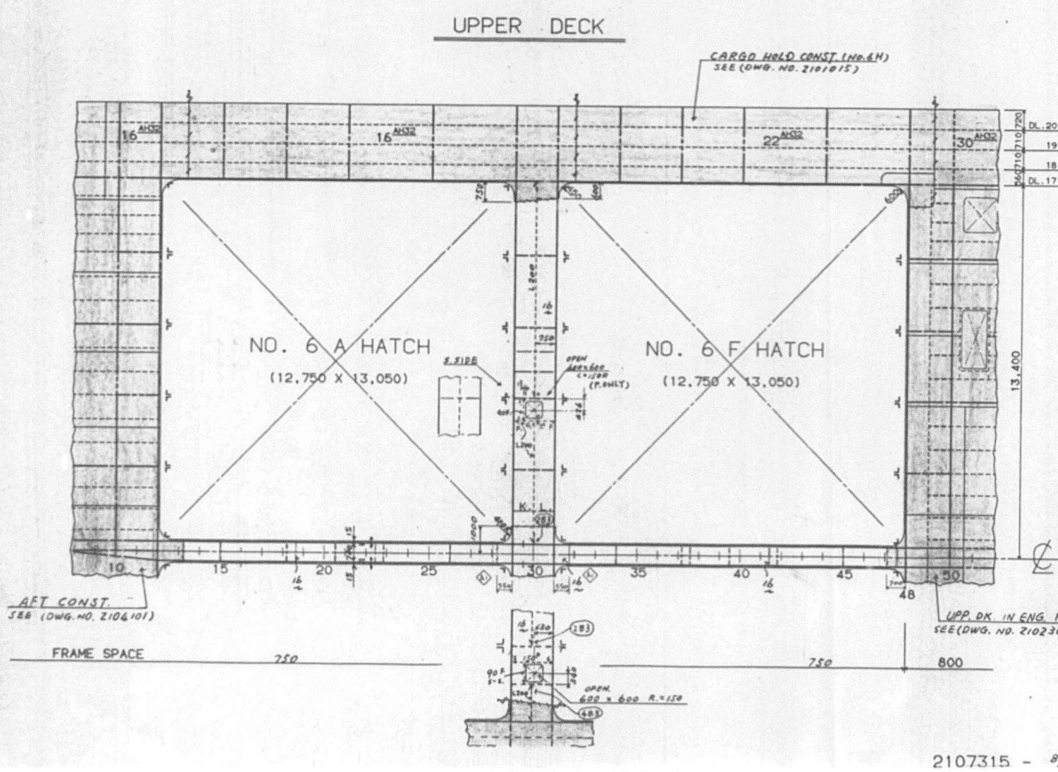
671

HATCH COAM. TOP



2107315 - 7/

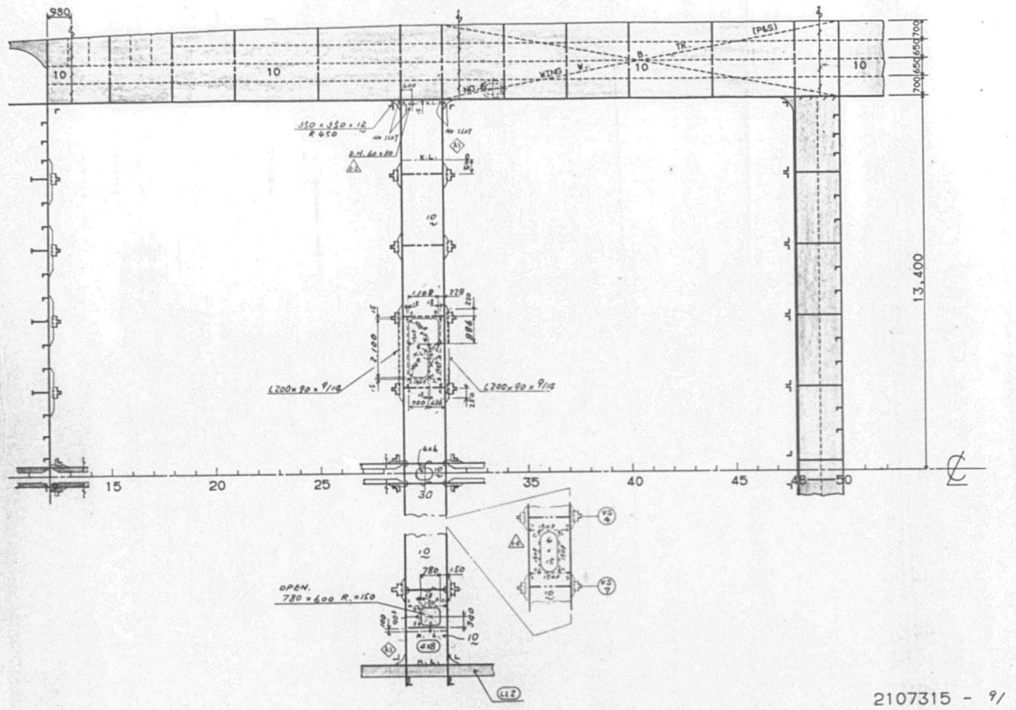
UPP.DK.



2107315 - 8/

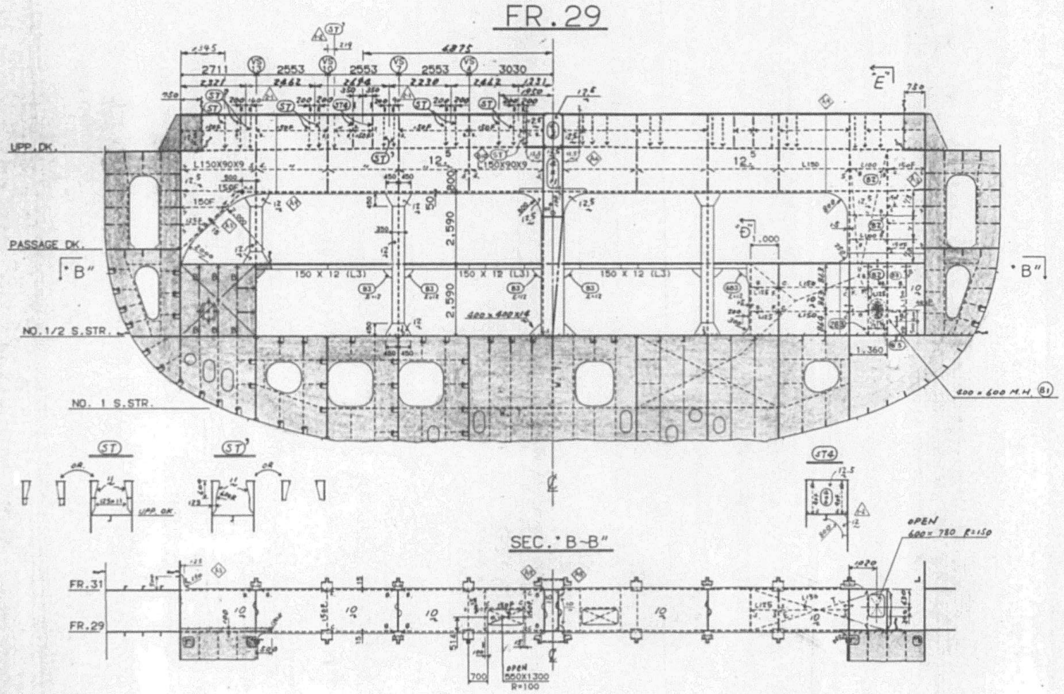
672

PASSAGE DECK

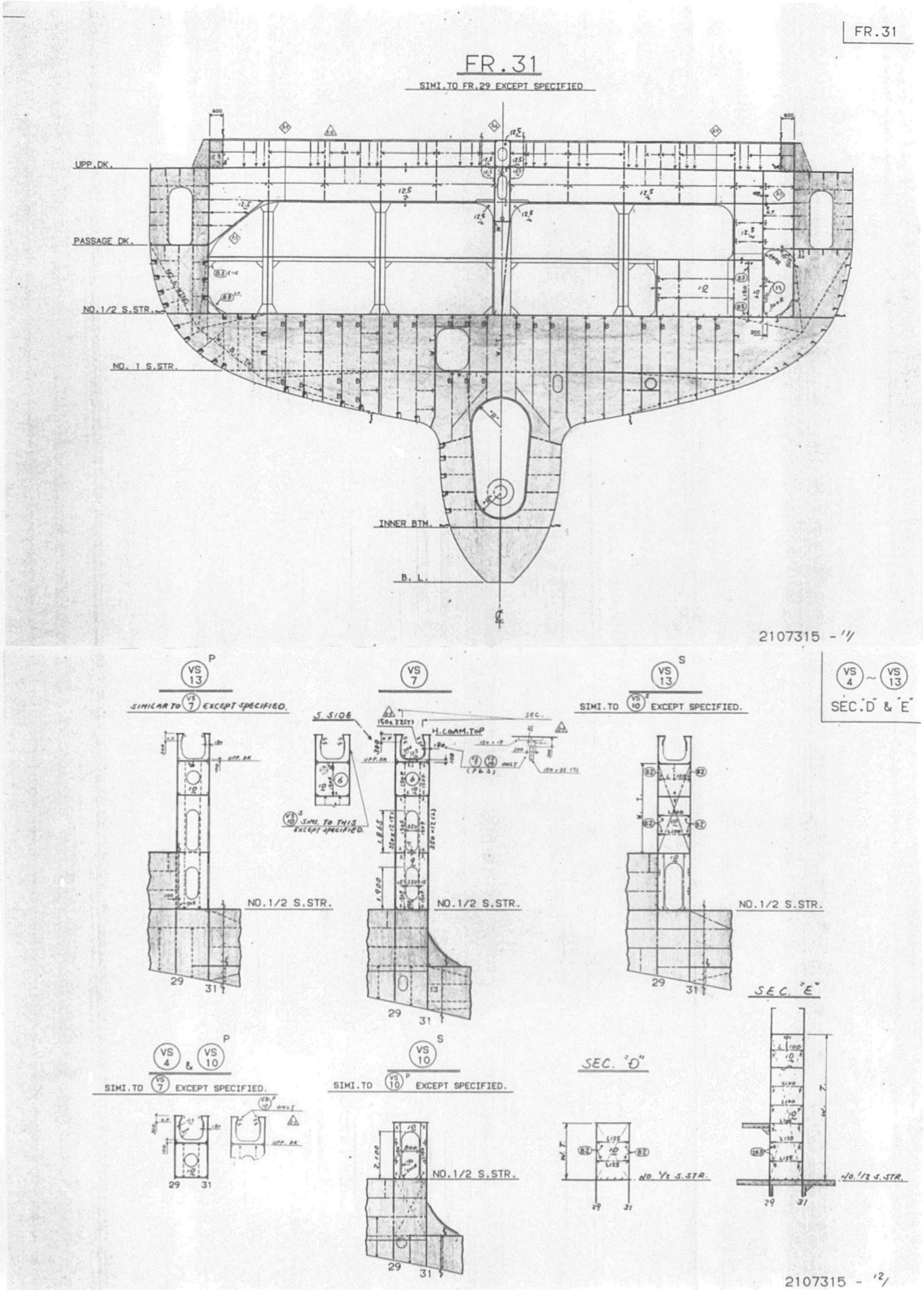


2107315 - 9/

FR.29



2107315 - 10/



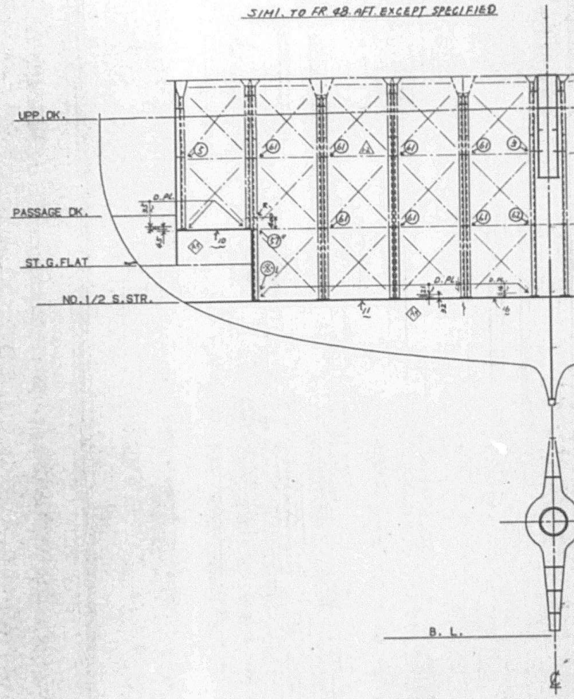
FR.31
FR.31
SIMI.TO FR.29 EXCEPT SPECIFIED
UPP.DK.
PASSAGE DK.
NO.1/2 S.STR.
NO. 1 S.STR.
INNER BTM.
B. L.
2107315 - 1/1
VS 4 ~ VS 13
SEC."D" & "E"
VS 13 P
SIMILAR TO VS 7 EXCEPT SPECIFIED.
VS 7
S.SIDE
H.COAM.TOP
VS 13 S
SIMI.TO VS 10 S EXCEPT SPECIFIED.
NO.1/2 S.STR.
NO.1/2 S.STR.
NO.1/2 S.STR.
29
31
SEC."E"
VS 4 & VS 10 P
SIMI.TO VS 7 EXCEPT SPECIFIED.
VS 10 S
SIMI.TO VS 10 P EXCEPT SPECIFIED.
SEC."D"
NO.1/2 S.STR.
2107315 - 1/2

674

CELL GUIDE
FR. 12 FORE
FR. 48 AFT.

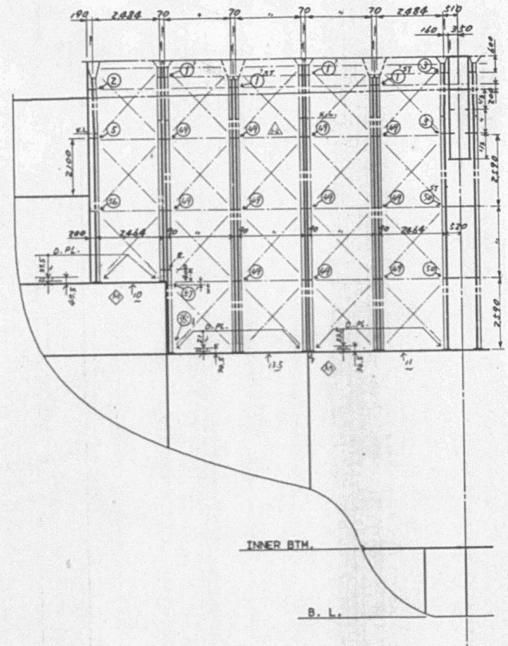
FR. 12 FORE

SIMI. TO FR 48 AFT. EXCEPT SPECIFIED



FR. 48 (AFT.)

CELL GUIDE L150×150×12

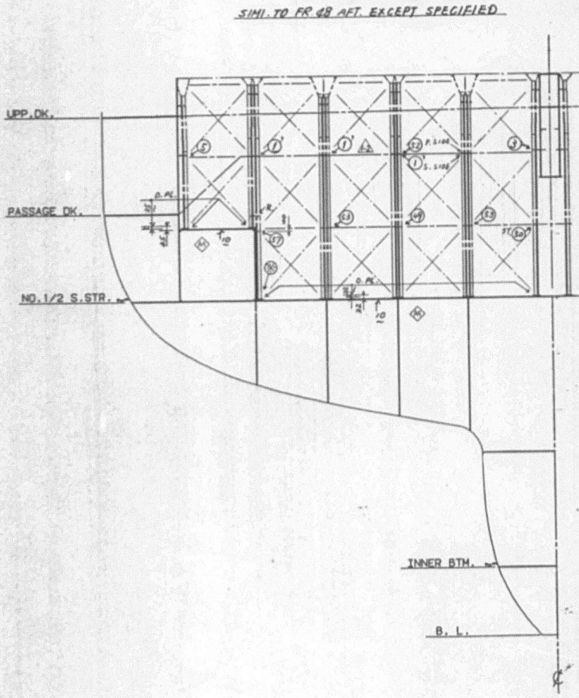


2107315 - 13/

CELL GUIDE
FR. 29 AFT.
FR. 31 FORE

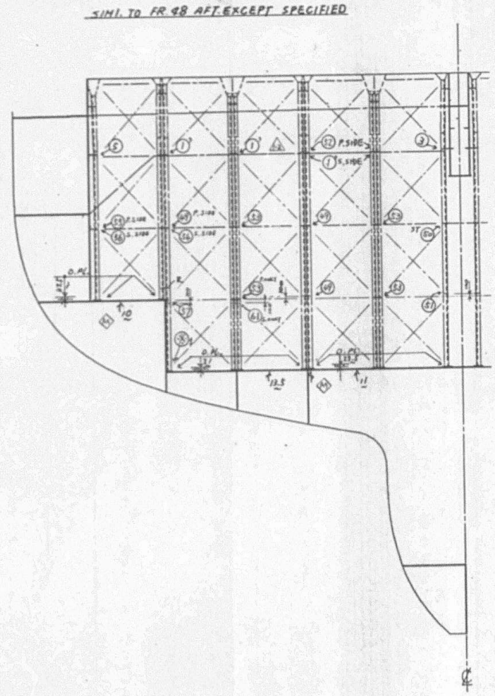
FR. 29 AFT.

SIMI. TO FR 48 AFT. EXCEPT SPECIFIED



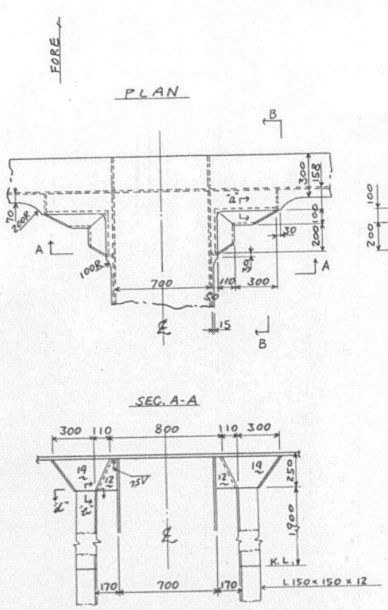
FR. 31 FORE

SIMI. TO FR 48 AFT. EXCEPT SPECIFIED



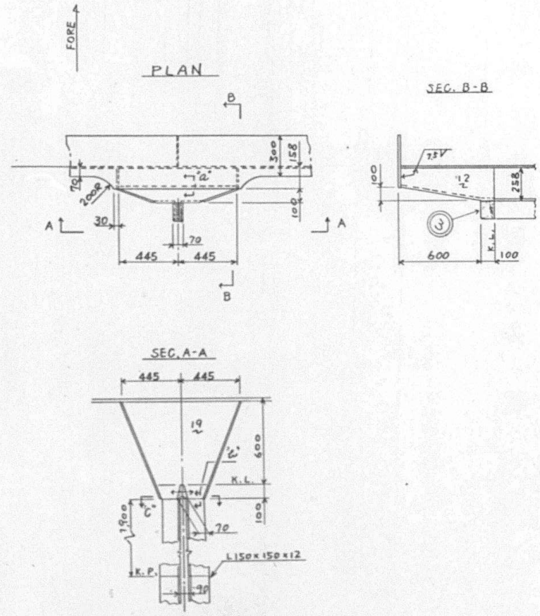
2107315 - 14/

(HB) ENTRY GUIDE



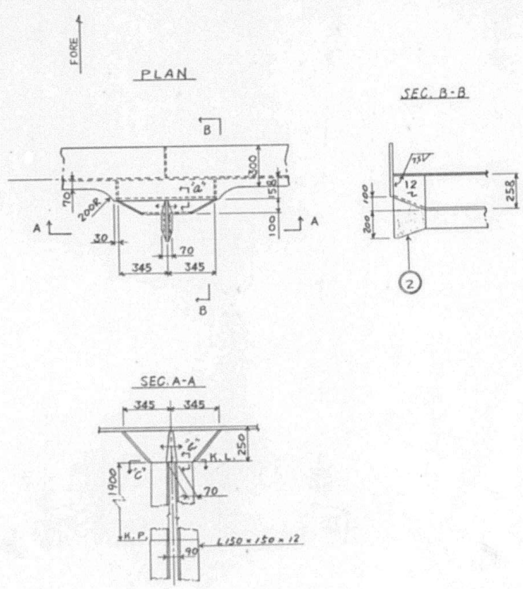
2107315 - 15/1

(HL) ENTRY GUIDE



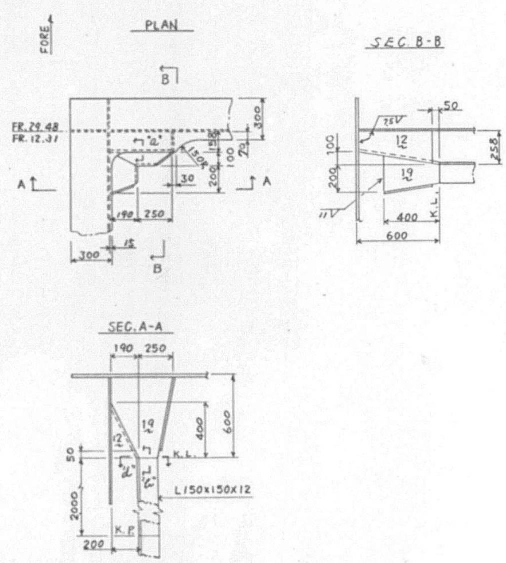
2107315 - 16/1

(HH) ENTRY GUIDE



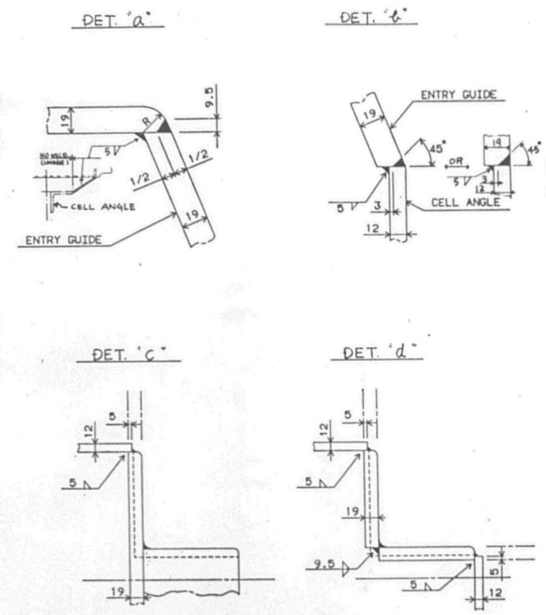
2107315 - 17/1

(HA) ENTRY GUIDE

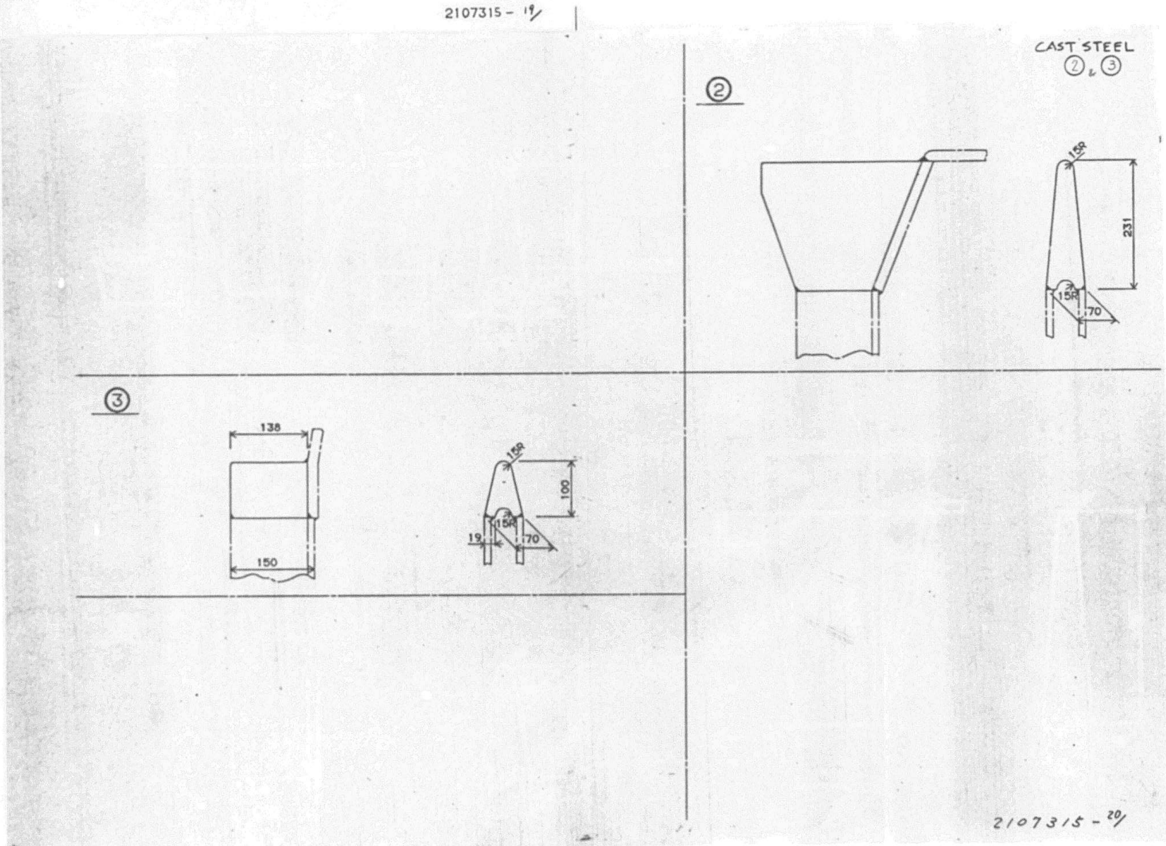


2107315 - 18/1

DETAIL OF ENTRY GUIDE



2107315 - 19/

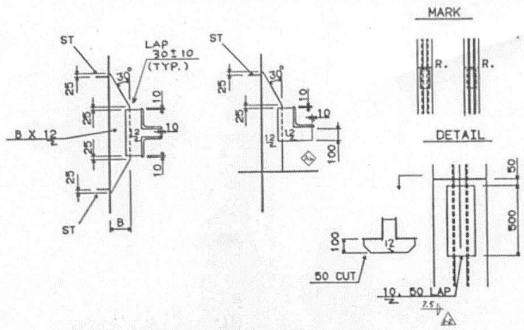


2107315 - 20/

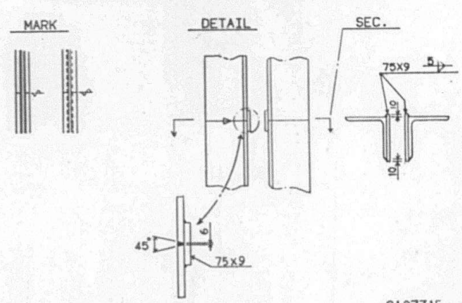
677

TYPICAL CELL GUIDE RIB

1. WELD.---- 5 EXCEPT SPECIFIED.
2. LAP WELD---- 10 EXCEPT SPECIFIED.
3. ST MARK STIFF.---- 90 X 9 F.B. (ST MARK TO BE FITTED.)
   (BOTH ENDS CLIP EXCEPT SPECIFIED)



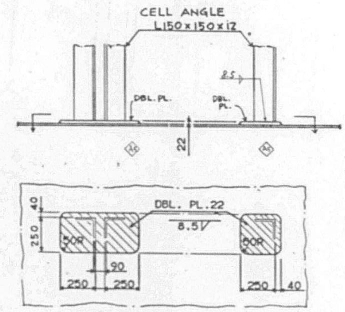
DETAIL OF CELL GUIDE CONNECTION

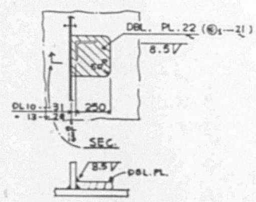


2107315 - 21/

DETAIL OF LOW. END

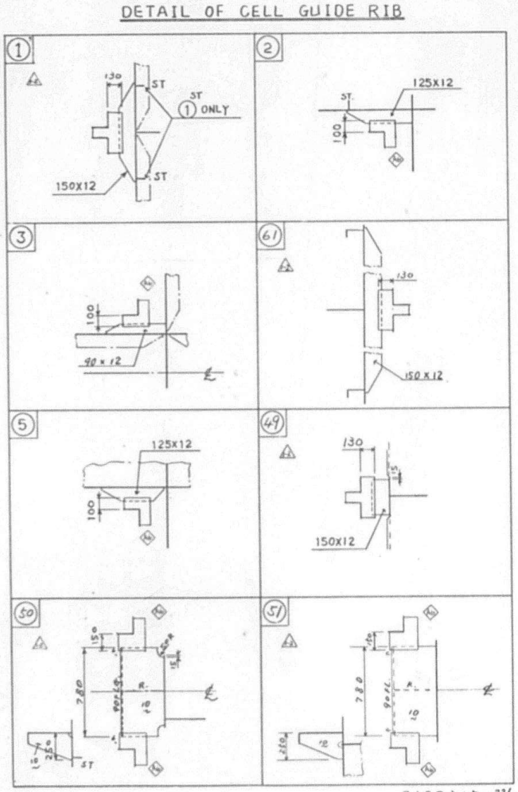
TYPICAL





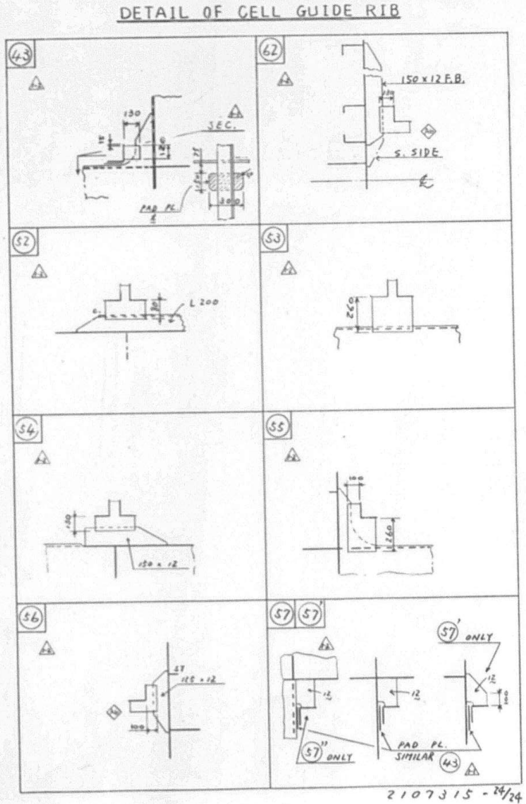
2107315- 22/

DETAIL OF CELL GUIDE RIB



2107315 -23/

DETAIL OF CELL GUIDE RIB



2107315 - 24/24

APPROVAL OF OWNER & REGULATORY BODIES

ALT. NO.	OWNER DATE	OWNER LETTER NO.	USCG DATE	USCG LETTER NO.	ABS DATE	ABS LETTER NO.	USPH DATE	USPH LETTER NO.
ORIGINAL	9 AUG '86	OFTY/MES-833			19 SEP '86	T-P-2		
1ST PART REV	7 AUG '86	TAM/89			19 SEP '86	T-P-2		
2ND PART REV	9 AUG '86	TAM/63			14 OCT '86	T-P-2		
3RD PART REV	14 NOV '86	TAM/111			17 NOV '86	T-P-2		
4TH PART REV	14 NOV '86	TAM/109			13 NOV '86	T-P-2		
4TH PART REV	14 NOV '86	TAM/110			18 NOV '86	T-P-2		

FINISHEDPLAN

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SHIPYARD AND SHIP'S NO. & NAME			
MITSUI TAMANO		MITSUBISHI KOBE	
NO.1323	DOCTOR LYKES	NO.1158	JAMES LYKES
NO.1324	ALMERIA LYKES	NO.1159	JOSEPH LYKES
NO.1325	TILLIE LYKES	NO.1164	SOLON TURMAN

MITSUI ENGINEERING & SHIPBUILDING CO.,LTD.
TAMANO WORKS

SHIP DESIGN DEPARTMENT MANAGER: [signature]
STRUCTURE DESIGN SEC.
SHIP'S NO. 1325 SHIP'S NAME TILLIE LYKES

コンテナープラットホーム
（含 コンテナー支持構造）
CONT. PLATFORM (INCL CONT. SUPPORT)

DATE (TEL. 2270)
JOB NO. TS1323/24/25
SCALE 1/100
LYKES REF. NO. 120508
MITSUI DRAWING NO. 2107316

(39 SHEETS WITH COVER)

PLAN RECORD

ALT. NO.	MARK	ALTERATION/DESCRIPTION	DATE & SIGNATURE
		"PREPARED FOR S.NO. 1323 AS FINISHED PLAN, MADE APPLICABLE TO S.NO. 1324 AND S.NO. 1325."	NOV. 28. '86

DWG.NO. 2107316 - 1/38

NOTES:-

1. BOTH SIDES TO BE SYMMETRICAL EXCEPT SPECIFIED.
2. TRANS. SECTIONS TO BE "LOOKING FORE" EXCEPT SPECIFIED.
3. REFER TO "CONSTRUCTION DETAILS (DWG NO. 2100811)" FOR STRUCTURAL DETAILS OF MEMBERS, ETC. EXCEPT SPECIFIED.
4. REFER TO "WELDING TABLE (DWG NO. 2100832)" FOR LEG LENGTH OF WELDING EXCEPT SPECIFIED.

備 考:-

1. 特記の他は，両舷対称とする。
2. 横断面図は，特記の他は後面を示す。
3. 構造詳細については，特記の他は '構造詳細図（図番2100811）'を参照のこと。
4. 溶接脚長については，特記の他は '溶接脚長表（図番2100832）'を参照のこと。

2107316 - 2/38

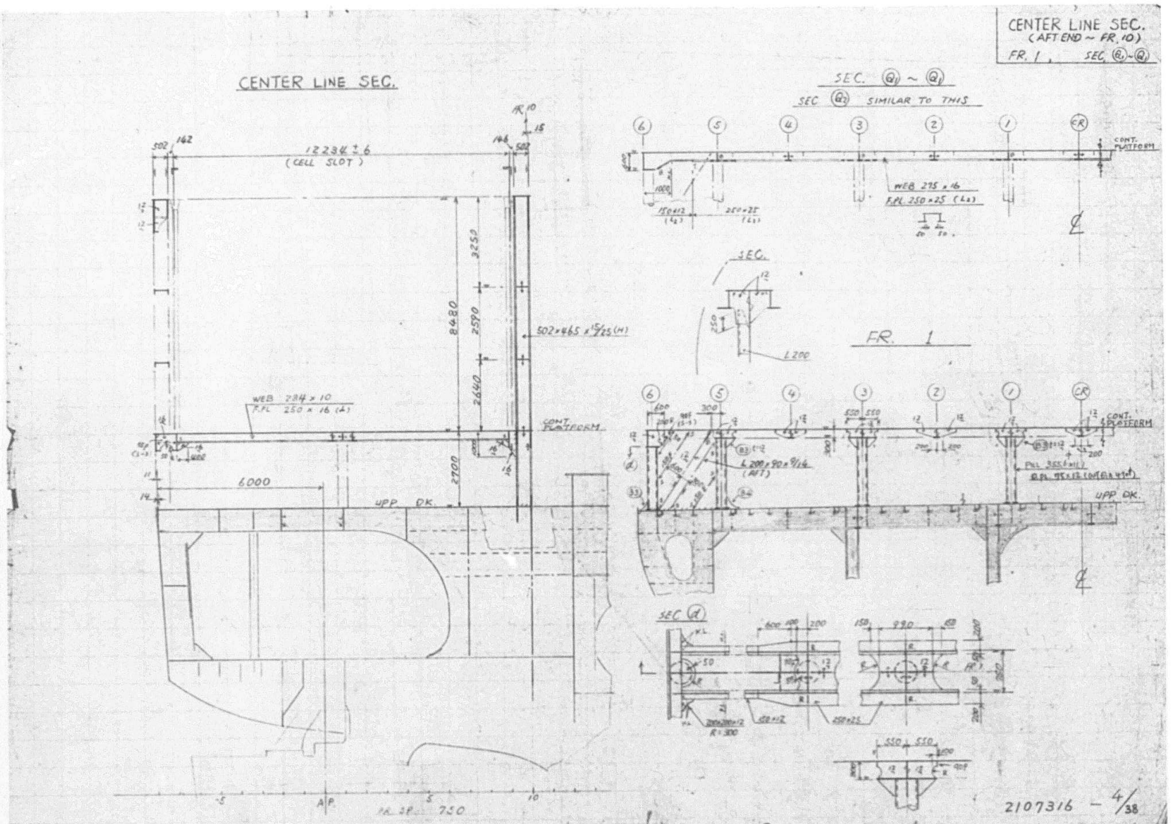
MATERIAL LIST

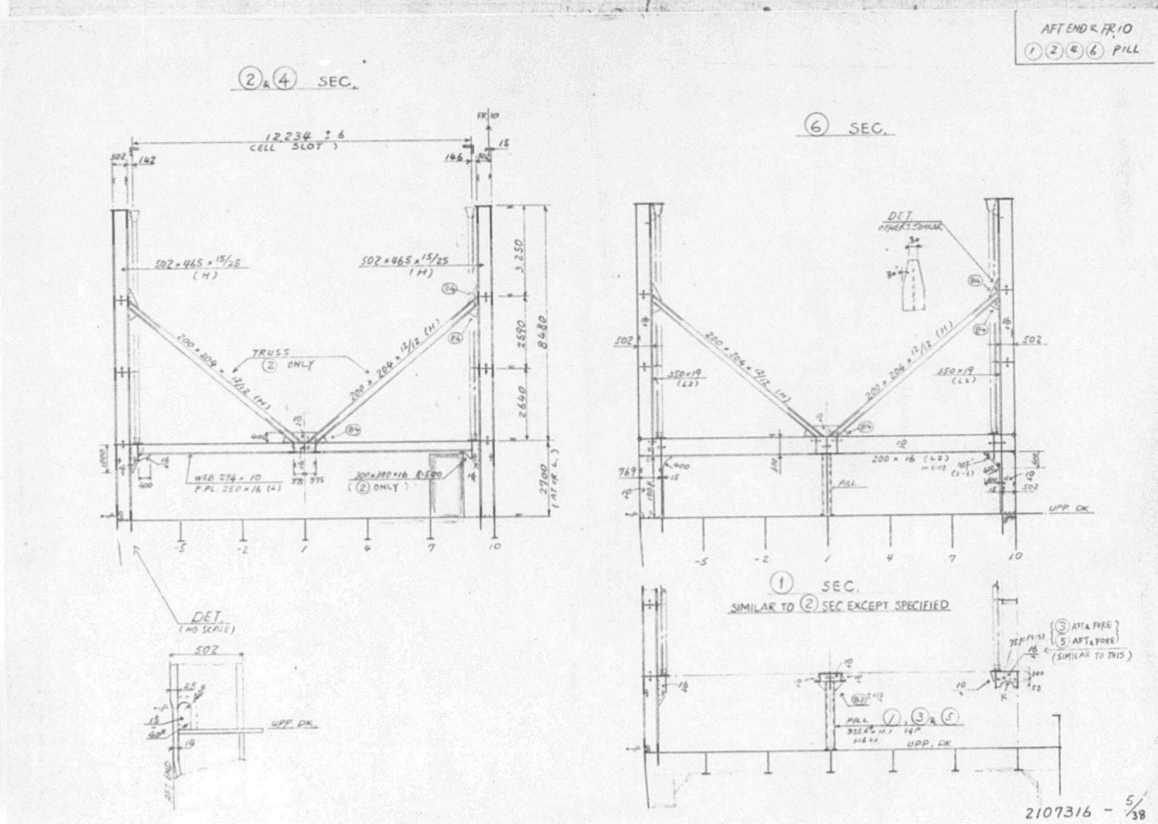
	ITEM	MTERIAL	NO.	WT.(TON) (ABT)	SHOP	ARR. NO.
1	ENTRY GUIDE	(STEEL CASTING) SC42 (MAX. CARBON 0.20%)			1.船工	—
2	—	—			—	—
3	—	—			—	—
4	"	"	18		"	—
5	"	"	36		"	—

(SHOP / ARR. NO.: INFORMATION FOR MES ONLY (記事No.))

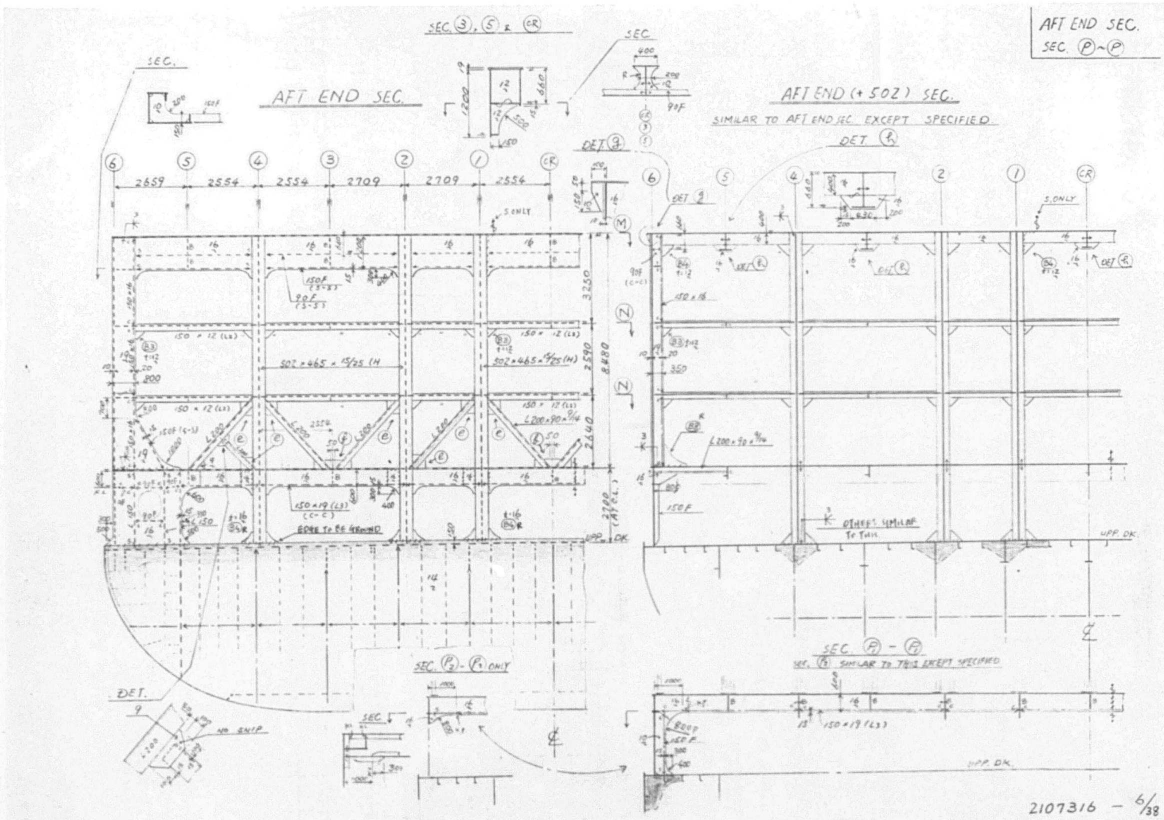
数量は一隻分とする

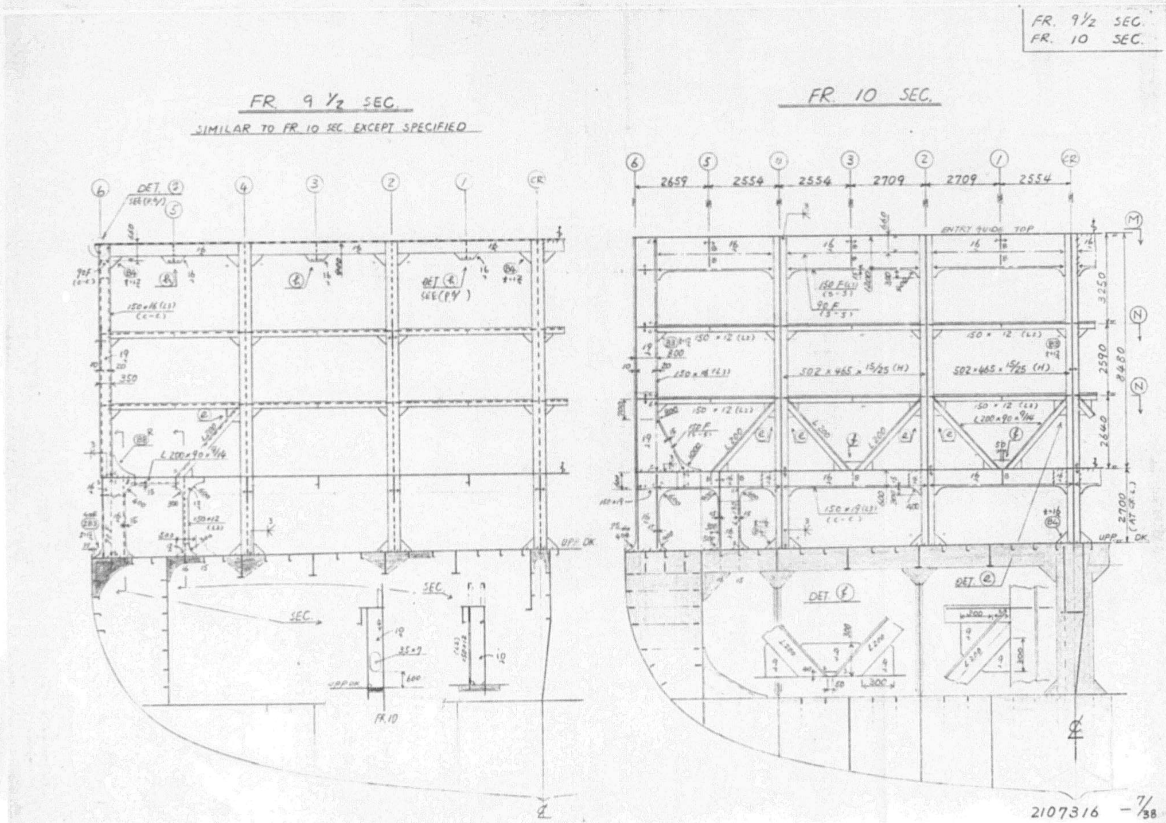
2107316 - 3/38


CENTER LINE SEC.
(AFT END ~ FR. 10)
FR. 1 , SEC. ⑥~⑥
CENTER LINE SEC.
12234 ± 6
(CELL SLOT)
WEB 234 × 10
F.PL. 250 × 16 (A)
CONT. PLATFORM
502 × 465 × 15/25 (H)
6000
UPP. DK.
A.P.
FR. SP. 720
SEC. ⑥ ~ ⑥
SEC ⑥ SIMILAR TO THIS
WEB 275 × 16
F.PL. 250 × 25 (L2)
SEC.
FR. 1
UPP. DK.
SEC ⓐ
2107316 - 4/38


AFT END & FR. 10
①②④⑥ PILL
②&④ SEC.
12234 ± 6
CELL SLOT
502 × 465 × 15/25 (H)
TRUSS
② ONLY
WEB 234 × 10
F.PL. 250 × 16 (A)
② ONLY
DET.
(NO SCALE)
UPP. DK.
⑥ SEC.
DET.
OTHERS SIMILAR
200 × 16 (L2)
PILL
UPP. DK.
① SEC.
SIMILAR TO ② SEC EXCEPT SPECIFIED
③ AFT & FORE
⑤ AFT & FORE
(SIMILAR TO THIS)
PILL ①, ③ & ⑤
UPP. DK.
2107316 - 5/38

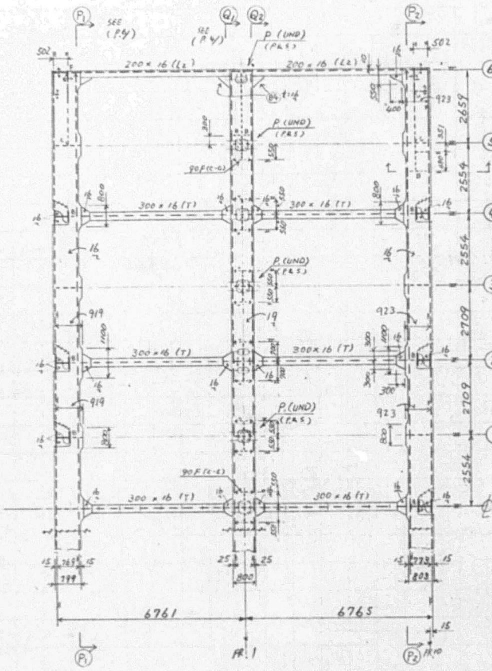
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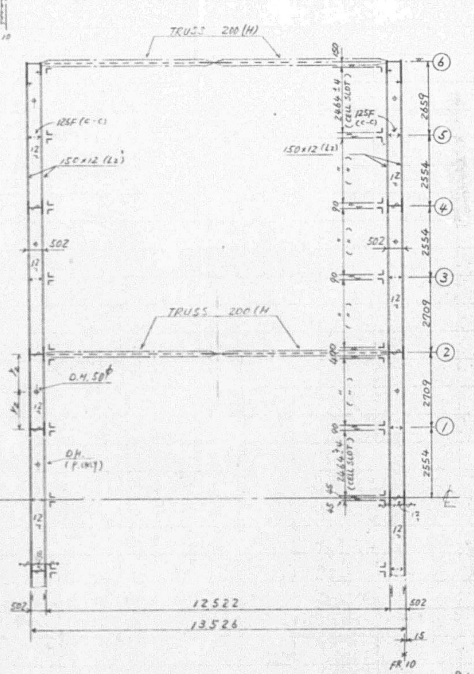

AFT END SEC.
SEC. (P)~(P)
SEC. (3), (5) & (CR)
AFT END SEC.
AFT END (+502) SEC.
SIMILAR TO AFT END SEC. EXCEPT SPECIFIED
DET (E)
DET (F)
DET 9
2659
2554
2709
502 × 465 × 15/25 (H)
150 × 12 (L2)
150 × 19 (L3)
L200 × 90 × 9/14
3250
2590
2640
8480
2700 (AT C.L.)
UPP. DK
OTHERS SIMILAR TO THIS
SEC. (P)2 - (P)3 ONLY
SEC. (P) - (P)
SEC. (P) SIMILAR TO THIS EXCEPT SPECIFIED
2107316 - 6/38


FR. 9 1/2 SEC.
FR. 10 SEC.
FR. 9 1/2 SEC.
SIMILAR TO FR. 10 SEC. EXCEPT SPECIFIED
FR. 10 SEC.
DET (E)
SEE (FR.9 1/2)
ENTRY GUIDE TOP
2659
2554
2709
150 × 12 (L2)
502 × 465 × 15/25 (H)
150 × 19 (L3)
L200 × 90 × 9/14
3250
2590
2640
8480
2700 (AT C.L.)
UPP. DK
DET (F)
DET (E)
FR.10
2107316 - 7/38

681

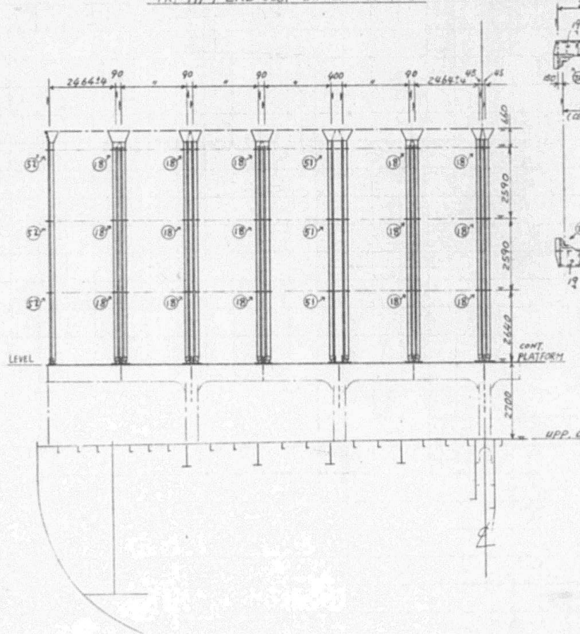
CONT. PLATFORM
SEC. (N)-(N)

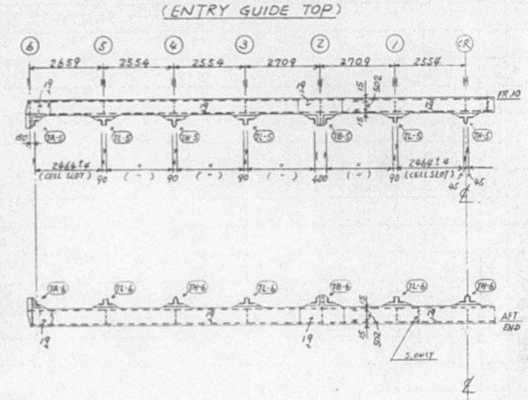




2107316 - 8/38

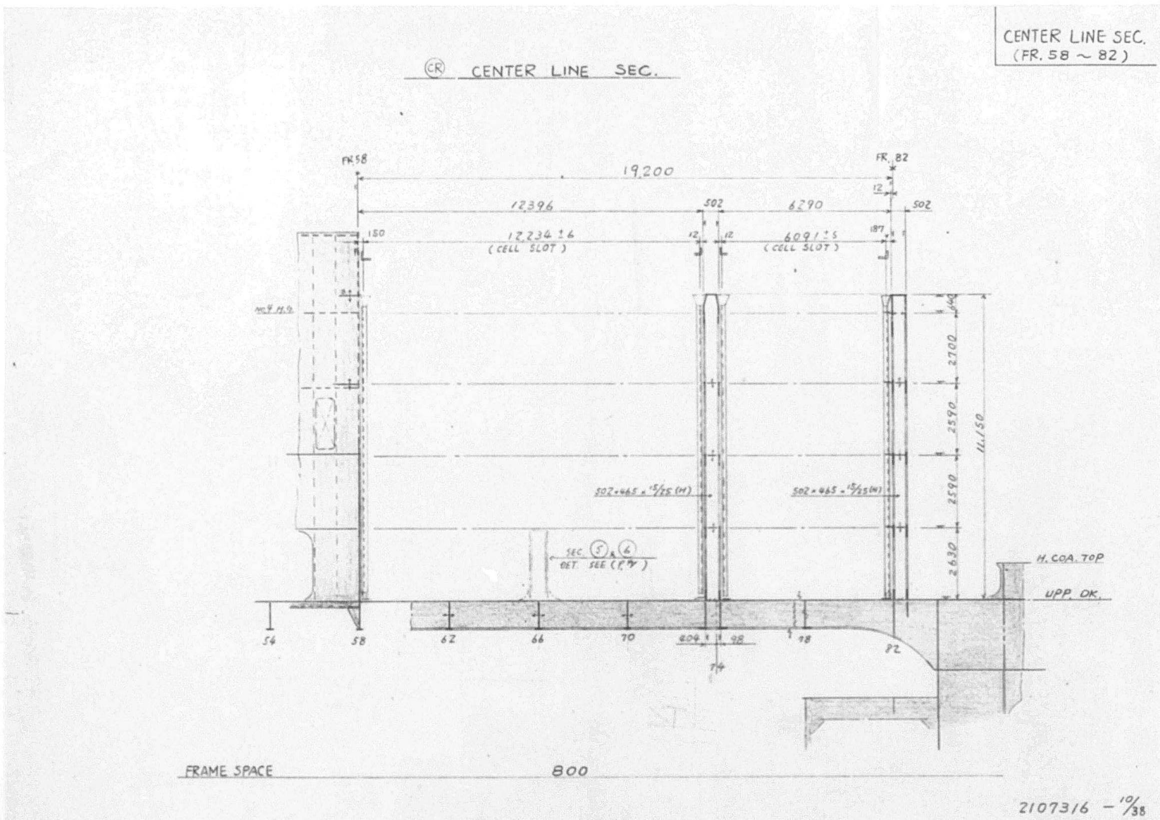
FR. 9½ AFT
SEC. (M)-(M)

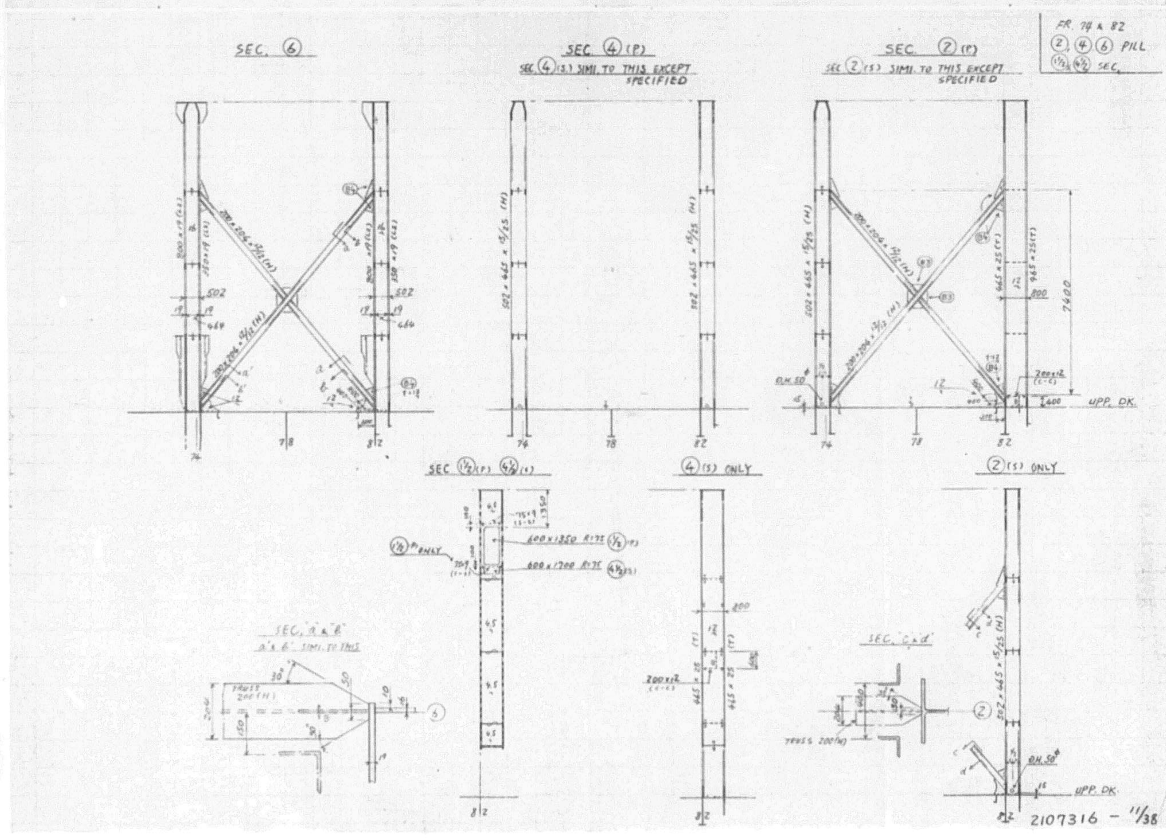




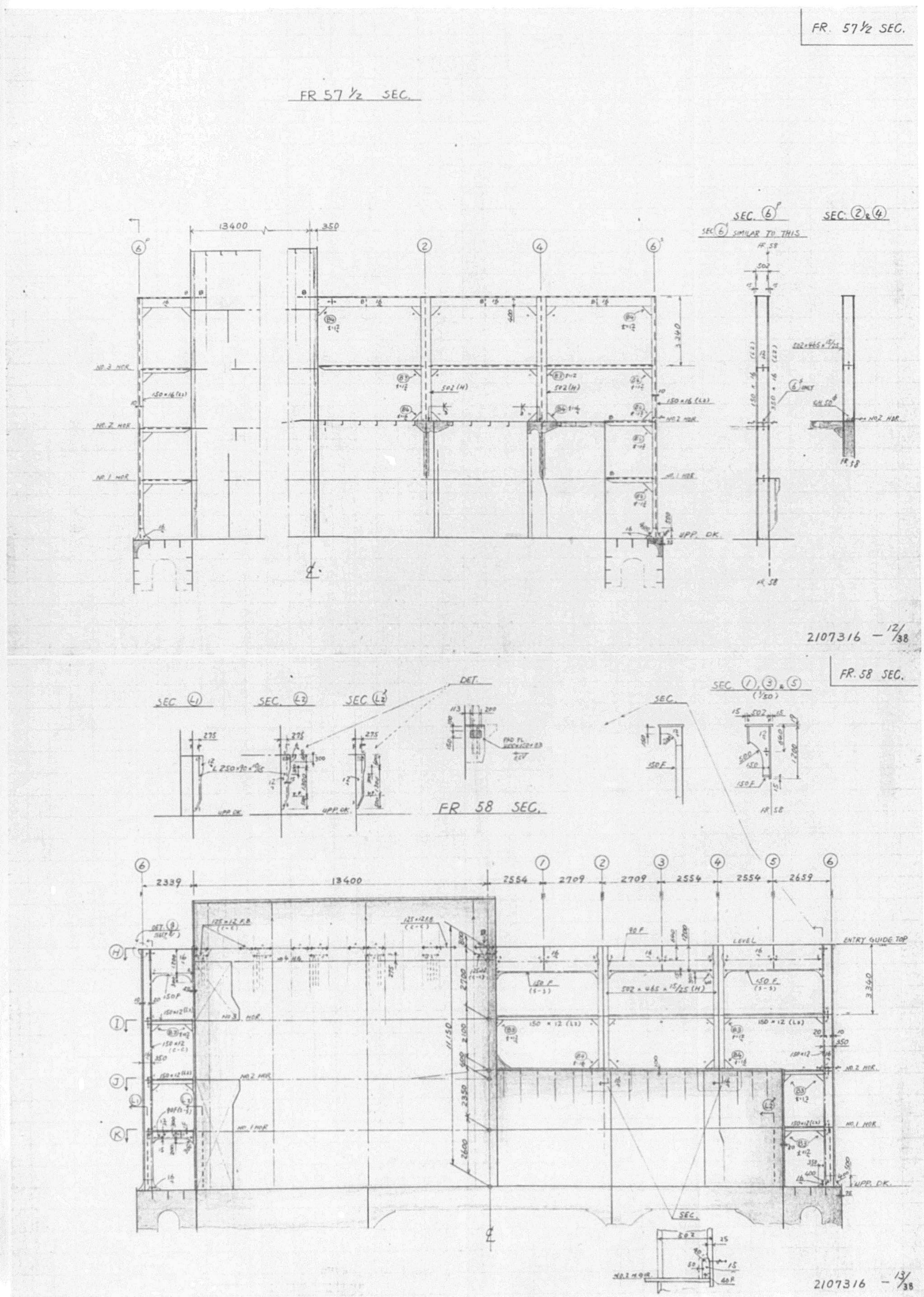
2107316 - 9/38

682


CENTER LINE SEC.
(FR. 58 ~ 82)
CR CENTER LINE SEC.
FR.58
FR.82
19,200
12396
502
6290
502
12,234±6
(CELL SLOT)
609±5
(CELL SLOT)
502×465×15/25 (H)
SEC. 5 & 6
DET. SEE (F/4)
2700
2590
2590
2630
11,150
H. COA. TOP
UPP. DK.
54
58
62
66
70
74
78
82
FRAME SPACE
800
2107316 – 10/38

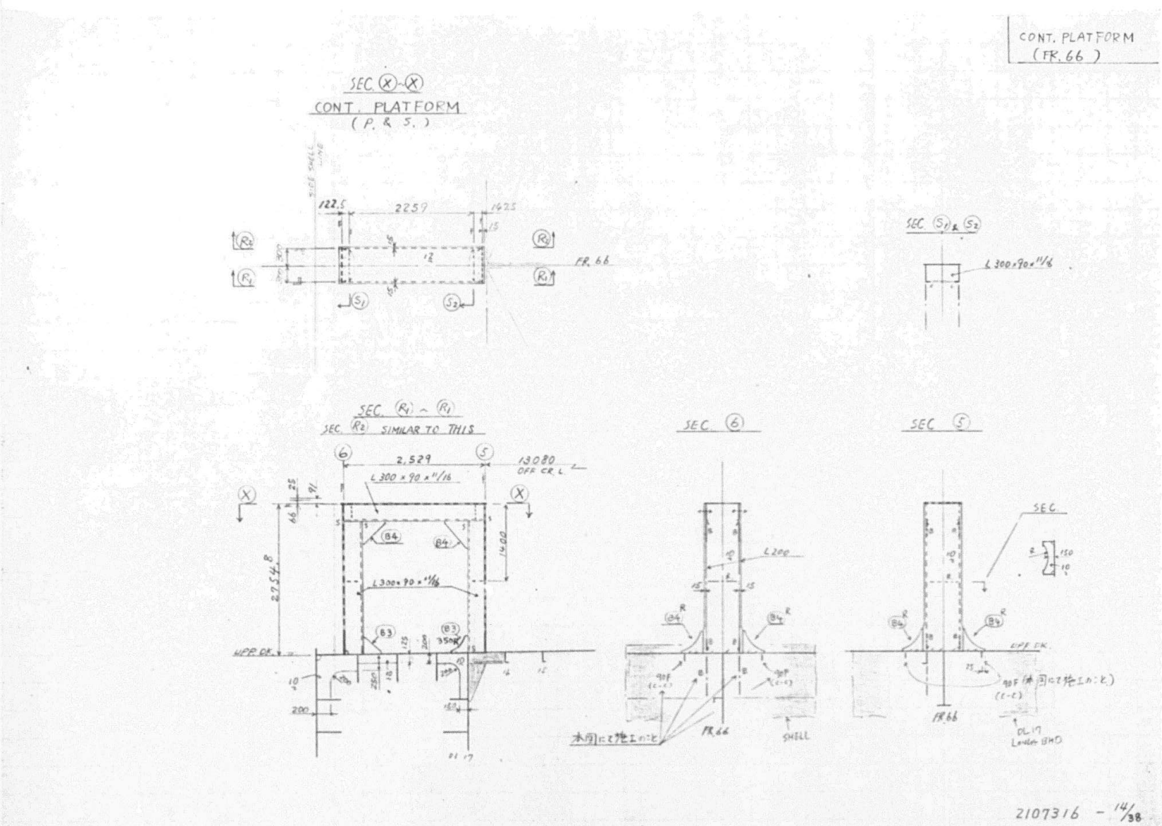

FR. 74 & 82
2, 4, 6 PILL
1½, 4½ SEC.
SEC. 6
SEC. 4 (P)
SEC 4 (S) SIMI. TO THIS EXCEPT SPECIFIED
SEC. 2 (P)
SEC 2 (S) SIMI. TO THIS EXCEPT SPECIFIED
7400
UPP. DK.
74
78
82
SEC 1½ (P) 4½ (S)
4 (S) ONLY
2 (S) ONLY
SEC. a & b
a' & b' SIMI. TO THIS
SEC. c & d
TRUSS 200 (H)
UPP. DK.
2107316 – 11/38

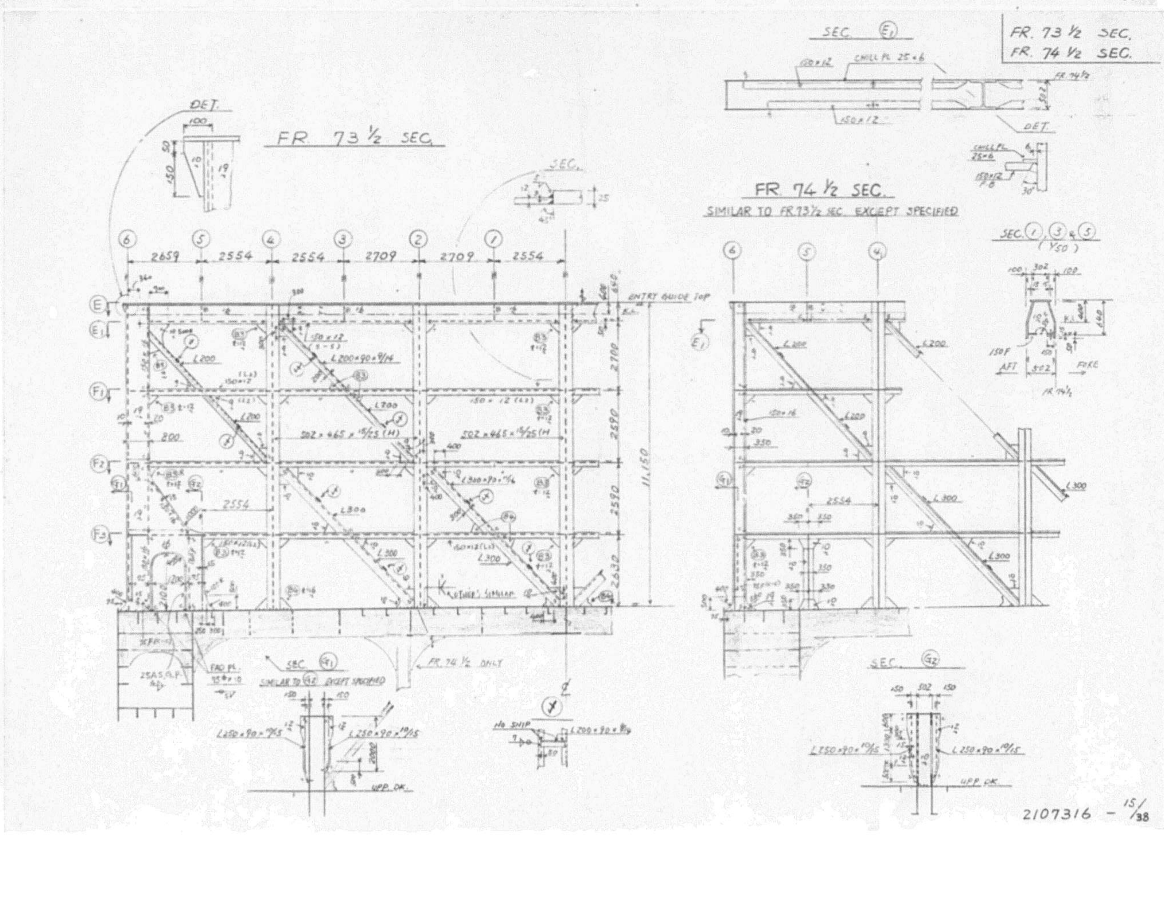
683



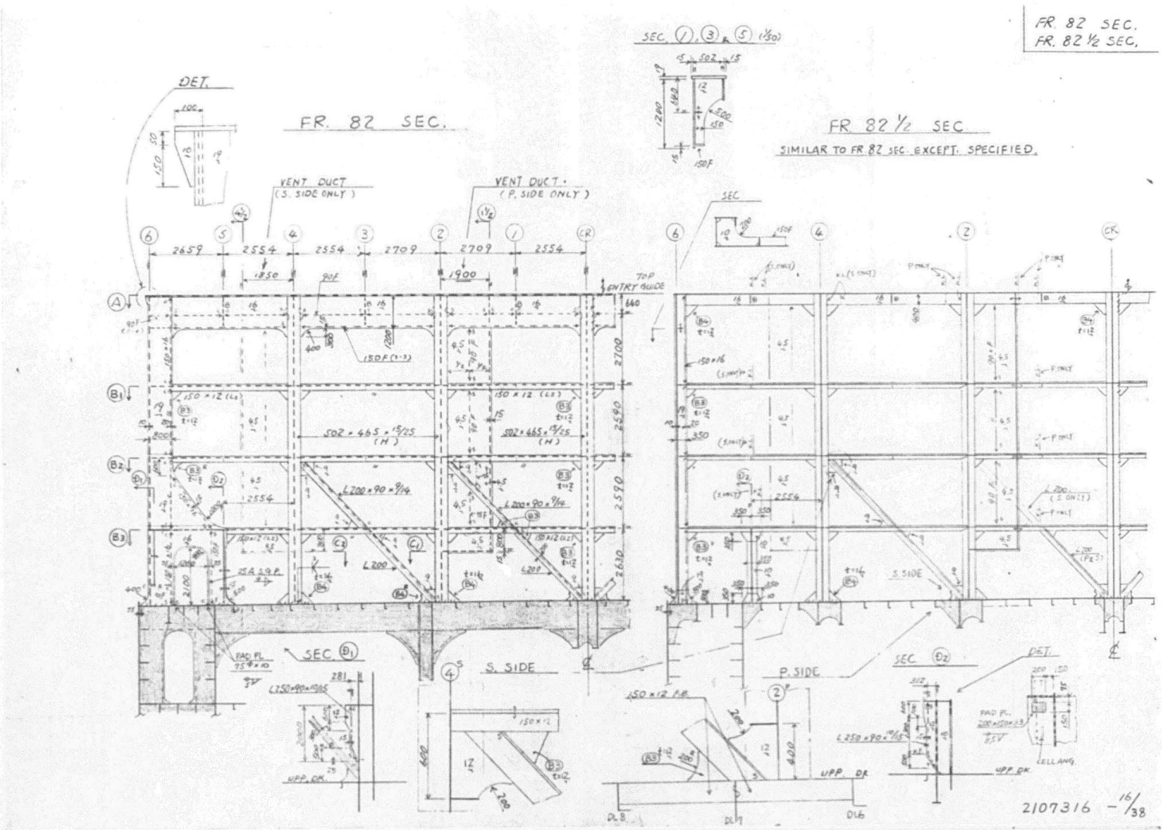
FR. 57 1/2 SEC.
FR 57 1/2 SEC.
SEC. 6
SEC. 2 & 4
SEC 6 SIMILAR TO THIS
13400
350
UPP. DK.
2107316 – 12/38
FR. 58 SEC.
SEC. L1
SEC. L2
SEC L2
DET.
SEC.
SEC. 1, 3 & 5
FR 58 SEC.
2339
13400
2554
2709
2709
2554
2554
2659
ENTRY GUIDE TOP
LEVEL
NO.3 HOR
NO.2 HOR
NO.1 HOR
UPP. DK.
2107316 – 13/38

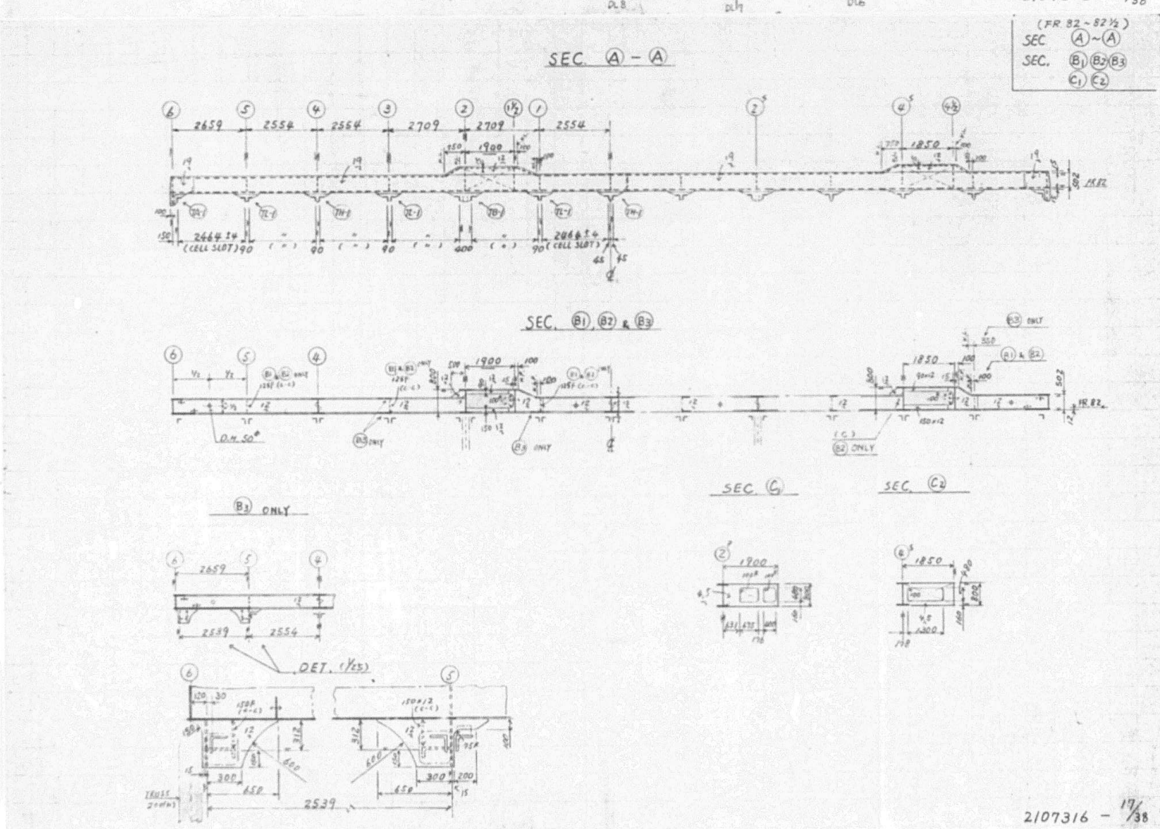
684

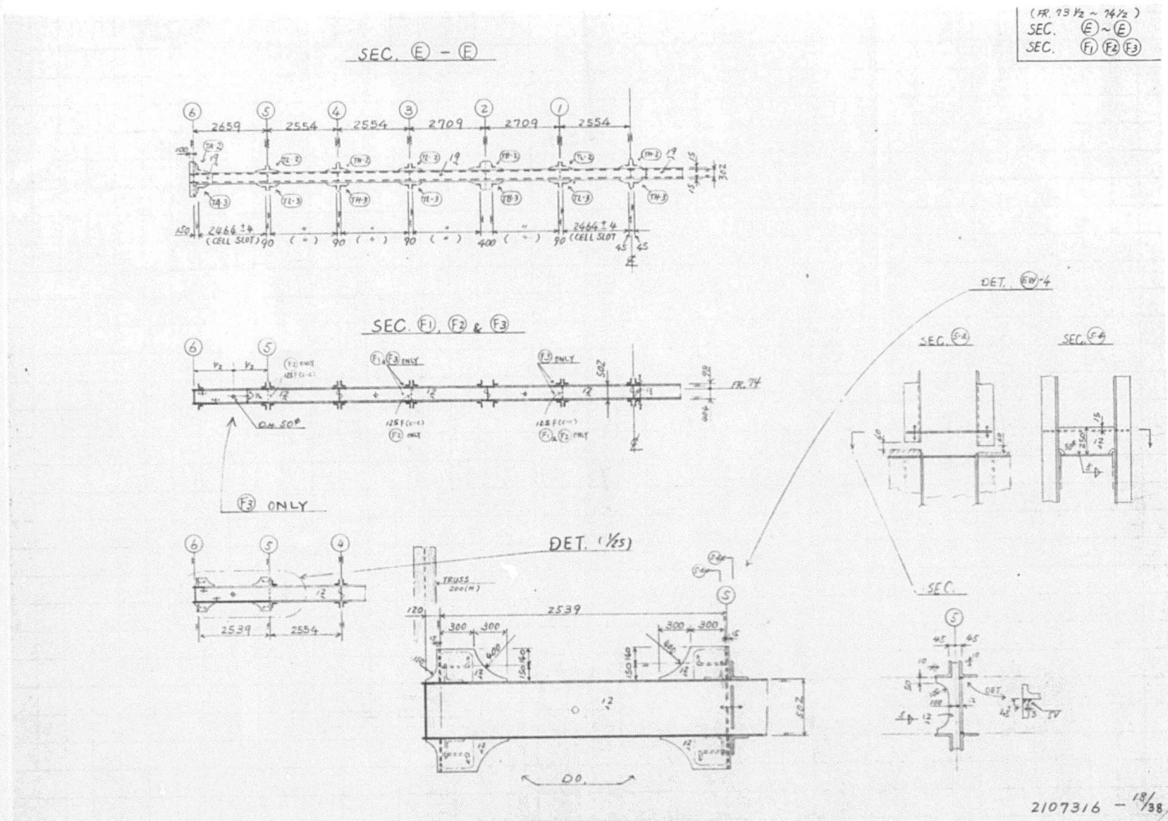

CONT. PLATFORM (FR. 66)
SEC. X-X
CONT. PLATFORM (P. & S.)
SEC. S1 & S2
SEC. R1 ~ R1
SEC. R2 SIMILAR TO THIS
SEC. 6
SEC. 5
2107316 - 14/38


FR. 73 1/2 SEC.
FR. 74 1/2 SEC.
SEC. E1
DET.
FR 73 1/2 SEC.
FR 74 1/2 SEC.
SIMILAR TO FR.73 1/2 SEC. EXCEPT SPECIFIED
SEC. 1, 3 & 5
SEC. G1
SIMILAR TO G2 EXCEPT SPECIFIED
SEC. G2
2107316 - 15/38

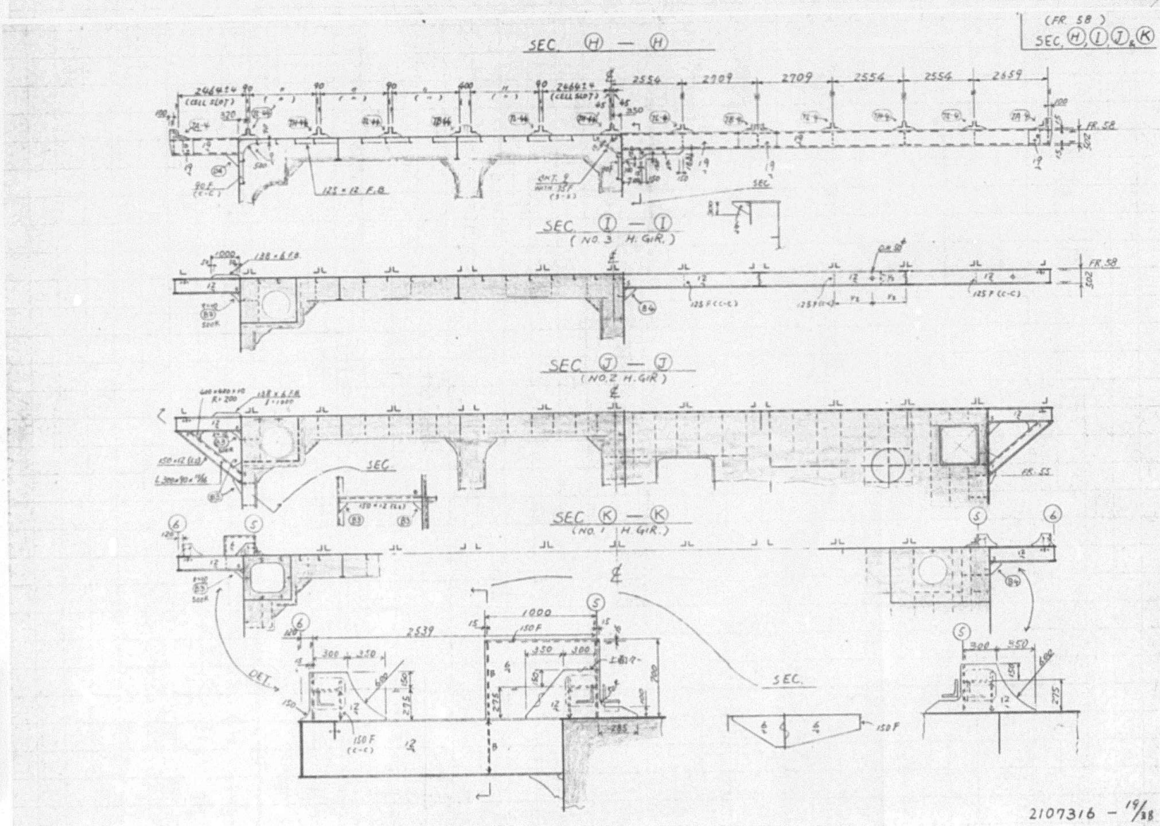
685


FR. 82 SEC.
FR. 82 ½ SEC.
FR. 82 SEC.
FR. 82 ½ SEC.
SIMILAR TO FR 82 SEC. EXCEPT. SPECIFIED.
SEC. ①, ③ & ⑤ (1/30)
DET.
VENT DUCT (S. SIDE ONLY)
VENT DUCT (P. SIDE ONLY)
TOP ENTRY GUIDE
SEC. Ⓑ1
S. SIDE
P. SIDE
SEC. Ⓓ2
DET.
UPP. DK
2107316 - 16/38


(FR. 82 ~ 82½)
SEC. Ⓐ~Ⓐ
SEC. Ⓑ1 Ⓑ2 Ⓑ3 Ⓒ1 Ⓒ2
SEC. Ⓐ - Ⓐ
SEC. Ⓑ1, Ⓑ2 & Ⓑ3
SEC. Ⓒ1
SEC. Ⓒ2
Ⓑ3 ONLY
DET. (1/25)
2107316 - 17/38

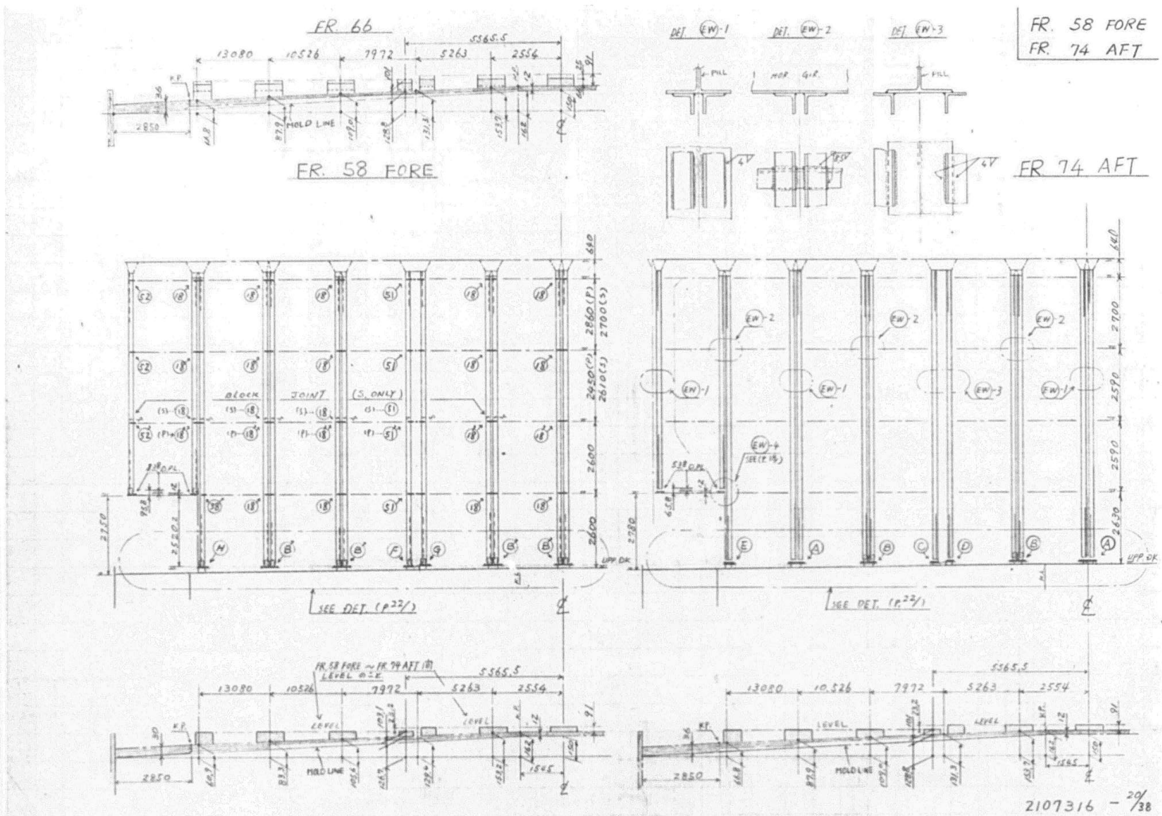


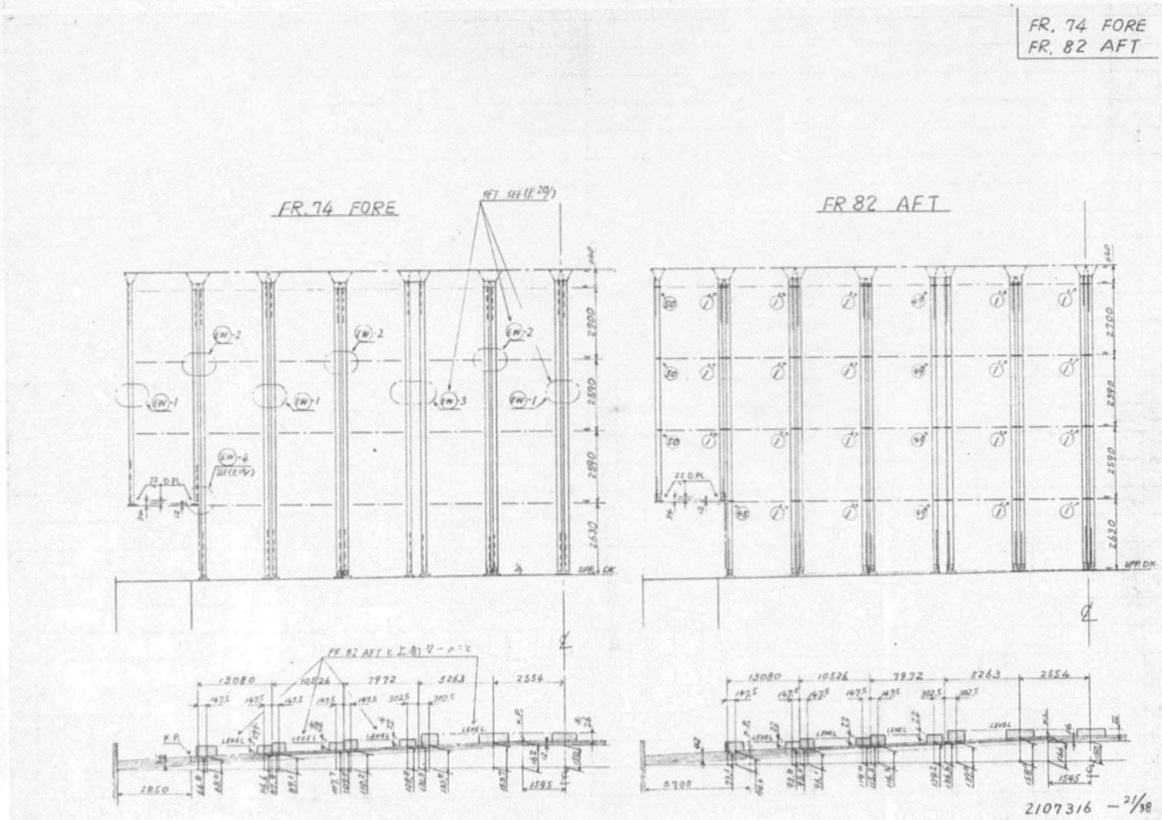
(FR. 73 1/2 ~ 74 1/2)
SEC. Ⓔ ~ Ⓔ
SEC. Ⓕ1 Ⓕ2 Ⓕ3
SEC. Ⓔ - Ⓔ
SEC. Ⓕ1, Ⓕ2 & Ⓕ3
Ⓕ3 ONLY
DET. (1/25)
DET. ⓌⓀ-4
SEC.
DO.
2107316 - 18/38



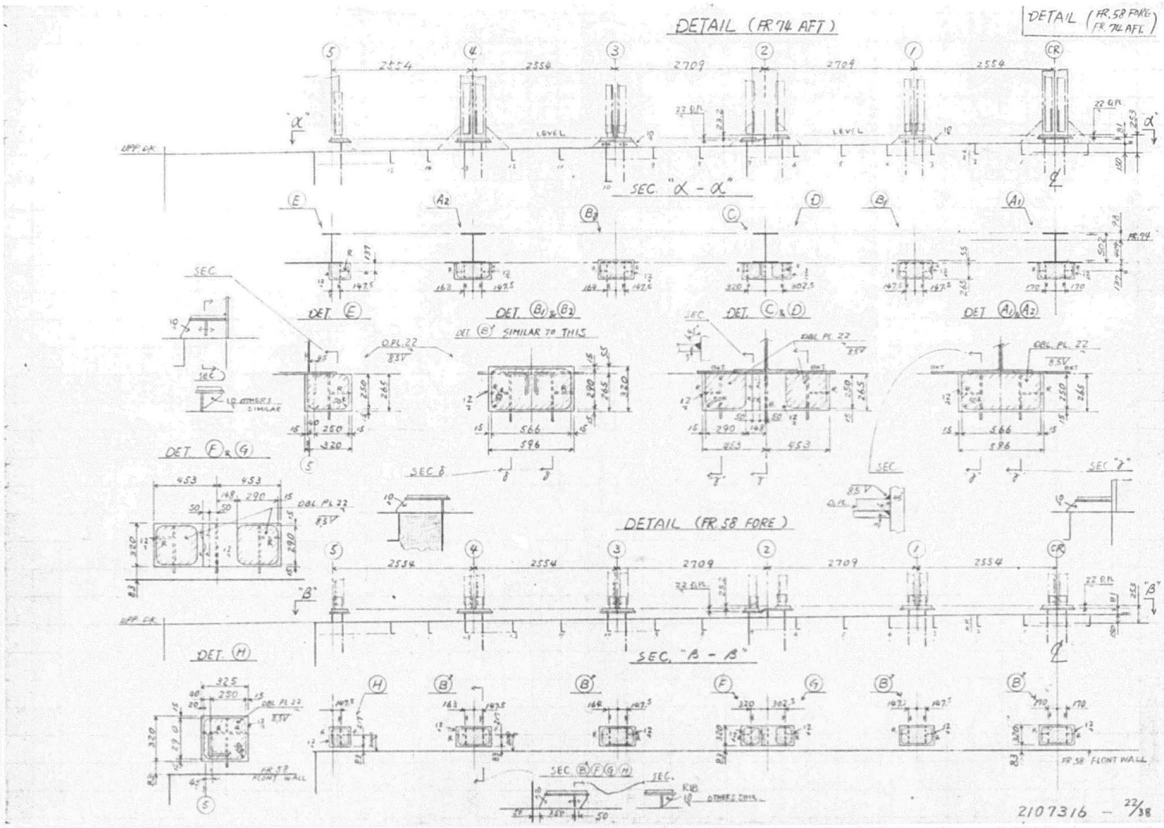
(FR. 58)
SEC. Ⓗ, Ⓘ, Ⓙ & Ⓚ
SEC. Ⓗ - Ⓗ
SEC. Ⓘ - Ⓘ
(NO. 3 H. GIR.)
SEC. Ⓙ - Ⓙ
(NO. 2 H. GIR.)
SEC. Ⓚ - Ⓚ
(NO. 1 H. GIR.)
SEC.
DET.
2107316 - 19/38

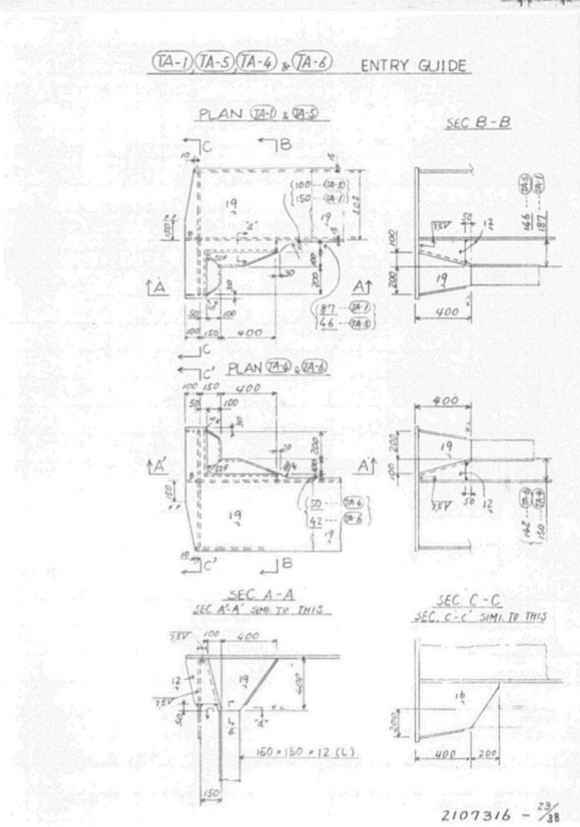
687

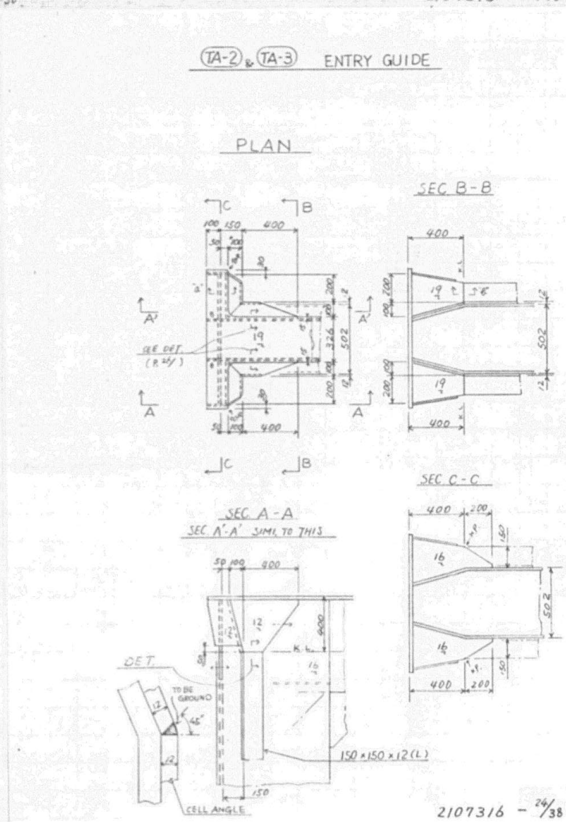

FR. 58 FORE
FR. 74 AFT
FR 66
DET. EW-1
DET. EW-2
DET. EW-3
FR. 58 FORE
FR 74 AFT
BLOCK JOINT (S. ONLY)
SEE DET. (P.22/)
SEE DET. (P.22/)
UPP. DK.
13080
10526
7972
5263
2556
5565.5
2850
MOLD LINE
LEVEL
2107316 - 20/38


FR. 74 FORE
FR. 82 AFT
FR. 74 FORE
FR 82 AFT
UPP. DK.
13080
10526
7972
5263
2554
2850
LEVEL
2107316 - 21/38

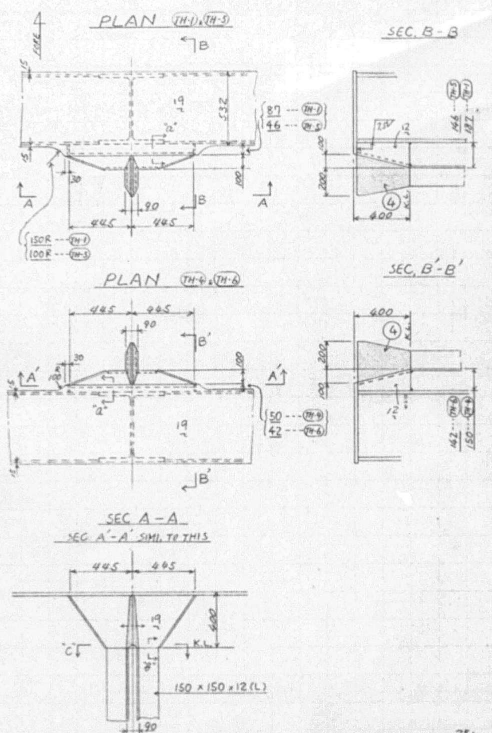
688


DETAIL (FR 74 AFT)
DETAIL (FR.58 FORE / FR.74 AFT)
SEC. "α - α"
DET. E
DET. B1 & B2
DET. B' SIMILAR TO THIS
DET. C & D
DET. A1 & A2
DET. F & G
DETAIL (FR 58 FORE)
SEC. "β - β"
DET. H
FR 58 FLONT WALL
2107316 - 22/38


TA-1 TA-5 TA-4 & TA-6 ENTRY GUIDE
PLAN TA-1 & TA-5
SEC B-B
PLAN TA-4 & TA-6
SEC A-A
SEC A'-A' SIMI. TO THIS
SEC C-C
SEC. C-C' SIMI. TO THIS
160 × 150 × 12 (L)
2107316 - 23/38

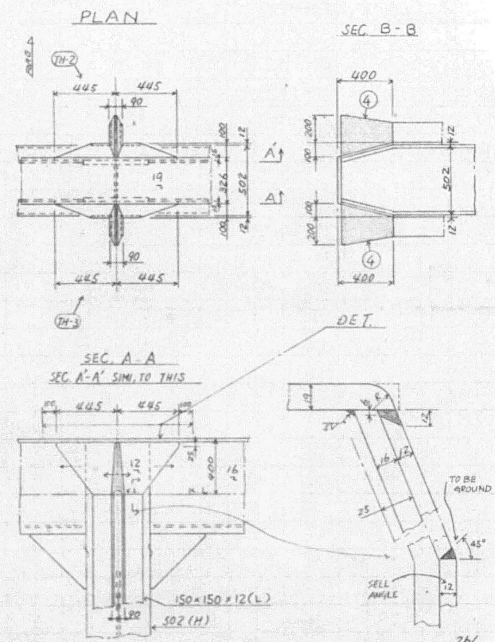

TA-2 & TA-3 ENTRY GUIDE
PLAN
SEC B-B
SEC C-C
SEC A-A
SEC A'-A' SIMI. TO THIS
DET.
CELL ANGLE
150 × 150 × 12 (L)
2107316 - 24/38

TH-1, TH-5, TH-4 & TH-6 ENTRY GUIDE



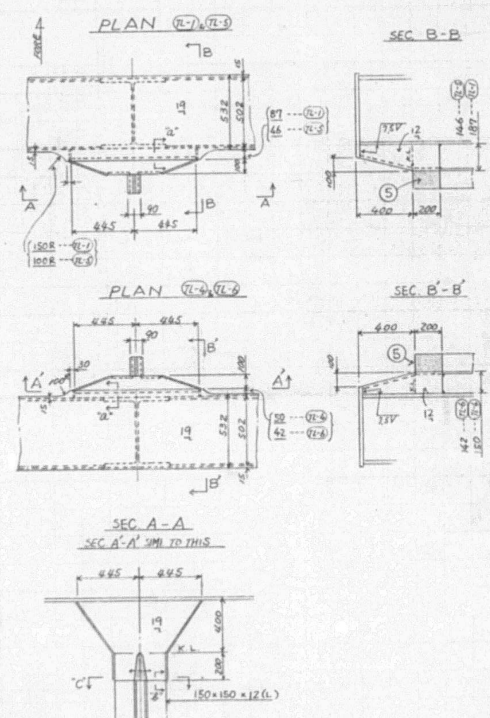
2107316 – 25/38

TH-2 & TH-3 ENTRY GUIDE



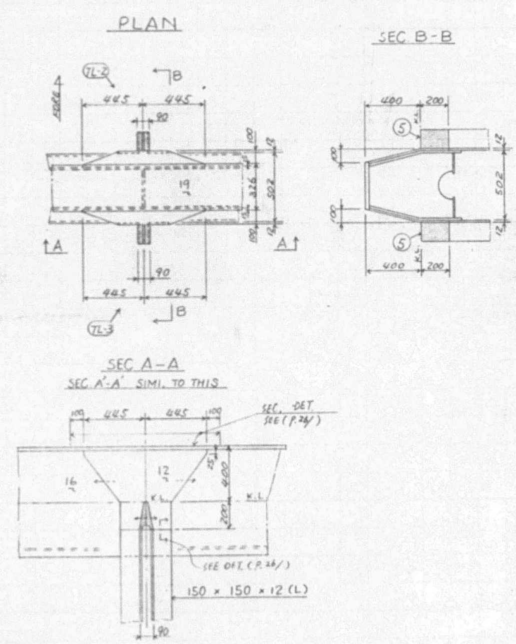
2107316 – 26/38

TL-1, TL-5, TL-4 & TL-6 ENTRY GUIDE



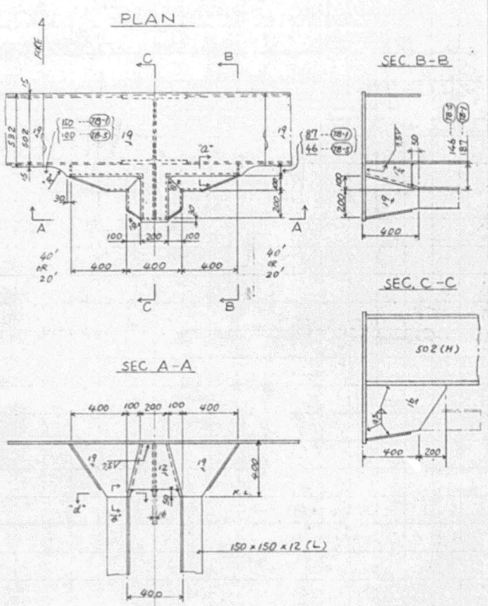
2107316 – 27/38

TL-2 & TL-3 ENTRY GUIDE



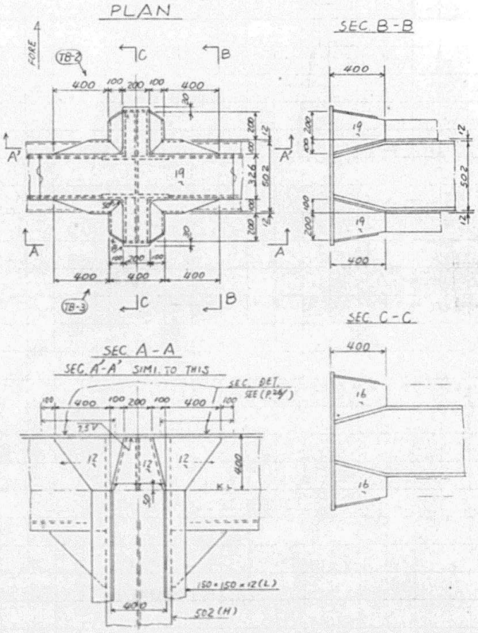
2107316 – 28/38

(TB-1) & (TB-5) ENTRY GUIDE



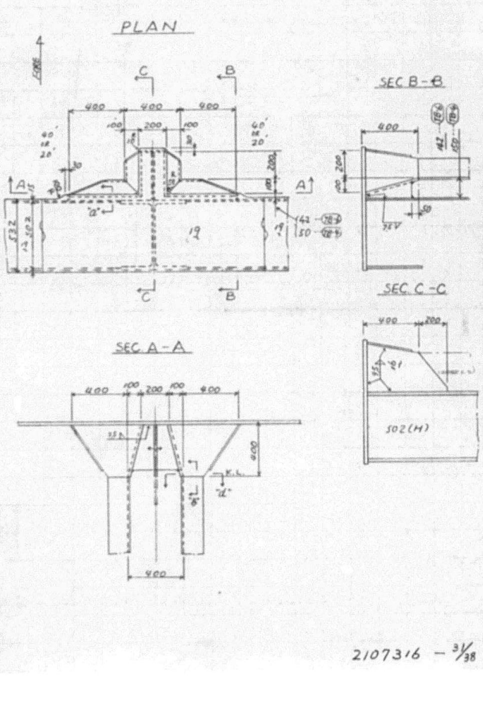
2107316 – 29/38

(TB-2) & (TB-3) ENTRY GUIDE



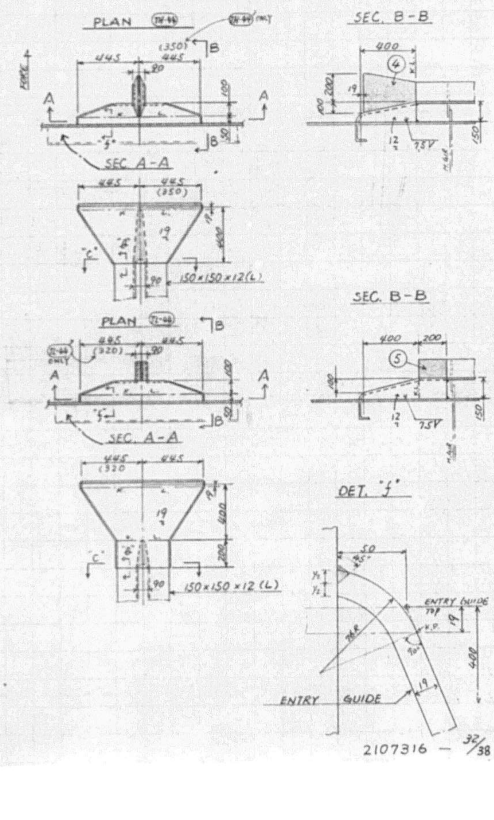
2107316 – 30/38

(TB-4) & (TB-6) ENTRY GUIDE

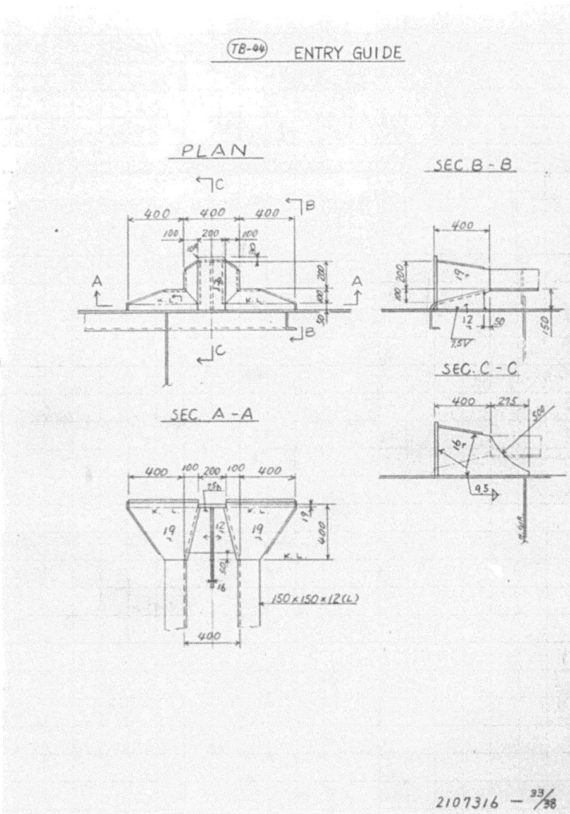


2107316 – 31/38

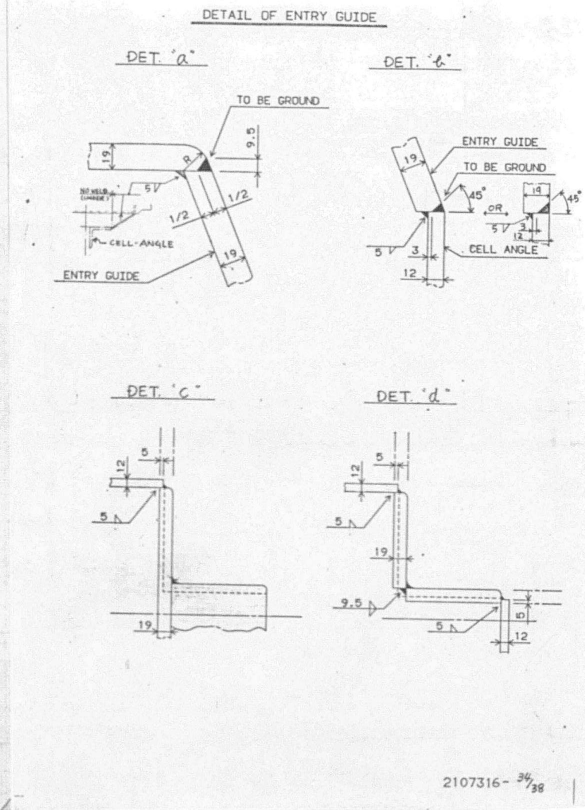
(TH-44) & (TL-44) ENTRY GUIDE



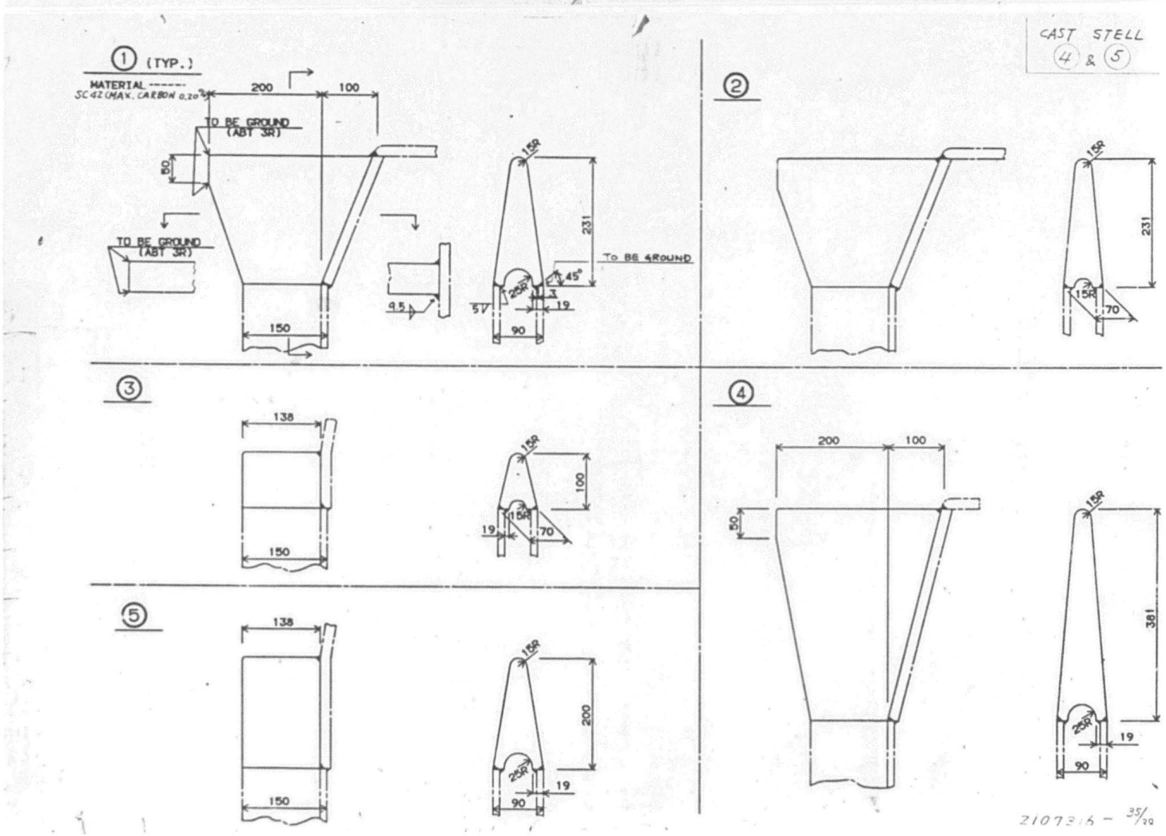
2107316 – 32/38



TB-44 ENTRY GUIDE
PLAN
SEC. B-B
SEC. C-C
SEC. A-A
150×150×12(L)
2107316 - 33/38



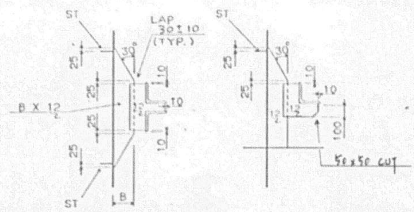
DETAIL OF ENTRY GUIDE
DET. 'a'
DET. 'b'
TO BE GROUND
CELL-ANGLE
ENTRY GUIDE
CELL ANGLE
DET. 'c'
DET. 'd'
2107316- 34/38



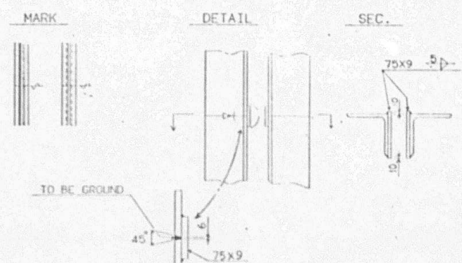
CAST STELL 4 & 5
1 (TYP.)
MATERIAL
SC42 (MAX. CARBON 0.20%)
TO BE GROUND (ABT 3R)
TO BE GROUND
2
3
4
5
2107316 - 35/38

TYPICAL CELL GUIDE RIB

1. WELD ---- 5 EXCEPT SPECIFIED.
2. LAP WELD ---- 10
3. ST MARK STIFF. ---- 90 X 9 F.B. (ST MARK TO BE FITTED.) (BOTH ENDS CLIP EXCEPT SPECIFIED)

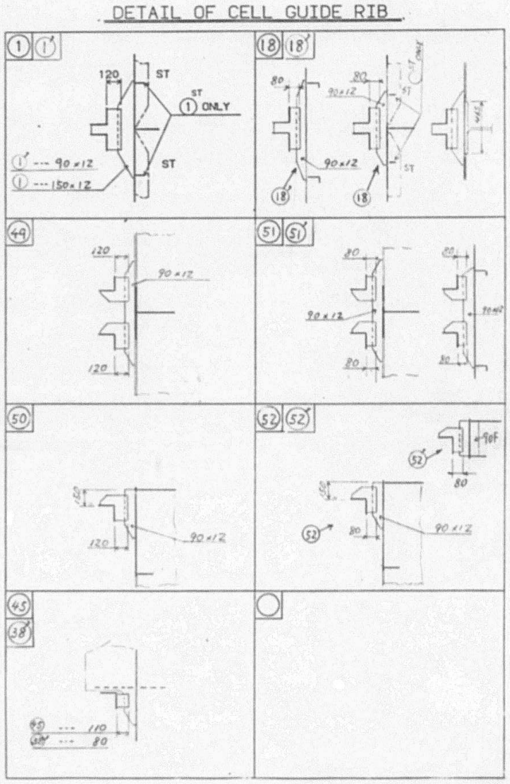


DETAIL OF CELL GUIDE CONNECTION



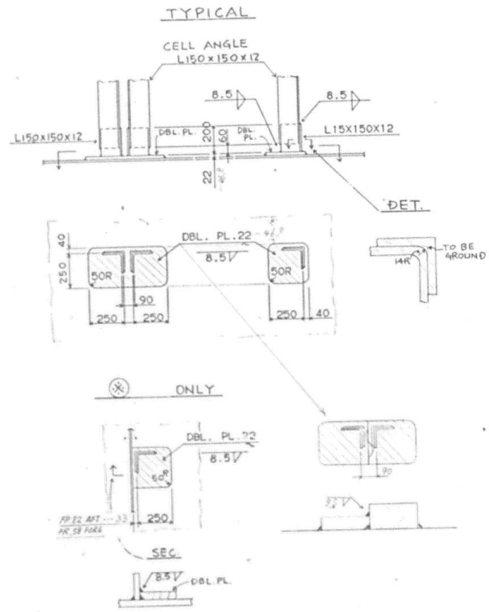
2107316 - 36/38

DETAIL OF CELL GUIDE RIB



2107316 - 38/38

DETAIL OF LOW. END



2107316 - 37/38

PLAN RECORD BY MHI

ALT. NO.	MARK	DESCRIPTION	DATE	BY
ORIG.		FOLLOWED MES ORIGINAL PLAN	JUL. 8. '85	
-01		FOLLOWED MES PARTLY REVISED PLAN NO.1	AUG. 2. '85	
-02		Do. NO.2	SEP. 3. '85	
-03	A	SUBMITTED FOR APPROVAL OF OWNER & ABS PREPARED TO MODIFICATION FOR MHI BUILDING SHIPS. 1. DELETED ADJUSTING PIECE OF LOWER END OF CELL GUIDE. 2. MODIFIED SHAPE OF CELL. GUIDE RIBS. BASED DWG. MES DWG NO. 2107316 (INCL. PARTLY REVISED PLAN NO.1 & NO.2)	SEP. 3. '85	
-04		FOLLOWED MES PARTLY REVISED PLAN NO.3	OCT. 9. '85	
-05		Do. NO.4	OCT. 16. '85	
-06		Do. NO.5	OCT. 22. '85	
-F	—	PREPARED AS FINISHED PLAN FOR S. No. 1158	MAR. 11. '87	

40 SHEETS WITH COVER

SHIP DESIGNING DEPARTMENT HULL DESIGNING SECTION

CLASS ABS

コンテナープラットホーム
(含 コンテナー支持構造)

CONT. PLATFORM (INCL CONT. SUPPORT)

ORDER 01-15800 (~~01-15900~~ ~~01-16400~~)

DRAWING NO. HS-19460-F

LYKES REF. NO. 120508

MITSUBISHI HEAVY INDUSTRIES, LTD.
KOBE SHIPYARD & ENGINE WORKS

APPROVAL OF OWNER & REGULATORY BODIES

ALT. NO.	OWNER DATE	OWNER LETTER NO.	USCG DATE	USCG LETTER NO.	ABS DATE	ABS LETTER NO.	USPH DATE	USPH LETTER NO.
ORIGINAL								

SHIPYARD AND SHIP'S NO. & NAME

~~MITSUI TAMANO~~		MITSUBISHI KOBE	
NO.1323	~~DOCTOR LYKES~~	NO.1158	JAMES LYKES
NO.1324	~~ALMERIA LYKES~~	NO.1159	~~JOSEPH LYKES~~
NO.1325	~~TILLIE LYKES~~	NO.1164	~~SOLON TURMAN~~

MITSUI ENGINEERING & SHIPBUILDING CO., LTD.
TAMANO WORKS

SHIP DESIGN DEPARTMENT — STRUCTURE DESIGN SEC.

PARTLY REVISED PLAN NO. 5

コンテナープラットホーム
(含 コンテナー支持構造)

CONT. PLATFORM (INCL CONT. SUPPORT)

JOB NO. TS1323/24/25 — SCALE 1/100 — LYKES REF. NO. 1205C8 — MITSUI DRAWING NO. 2107316-5

(13 SHEETS WITH COVER)

PLAN RECORD

ALT. NO.	MARK	ALTERATION/DESCRIPTION	DATE & SIGNATURE
ORIGINAL		PREPARED FOR APPROVAL OF OWNER & ABS.	'85
1	1	MISCELLANEOUS REVISION (DESIGN DEVELOPMENT)	JULY 18 '85 H.Y.
2	2	MISCELLANEOUS REVISION (DESIGN DEVELOPMENT) (REVISED FOR THE RE-ARRANGE OF VENT SYSTEM)	AUG. 27 '85 H.Y.
3	3	MISCELLANEOUS REVISION (DESIGN DEVELOPMENT)	SEP. 30 '85 H.Y.
4	4	MISCELLANEOUS REVISION (ALTERATION FOR THE CROSSING BETWEEN PEDESTAL AND PIPE HOLE ON UPR.DK)	OCT. 11 '85 H.Y.
5	5	MISCELLANEOUS REVISION (ALTERATION FOR KEEPING THE SAME LEVEL OF (2) MARK SPACER)	OCT. 14 '85 Y.H.

DWG. NO. 2107316

NOTES:-

1. BOTH SIDES TO BE SYMMETRICAL EXCEPT SPECIFIED.
2. TRANS. SECTIONS TO BE "LOOKING FORE" EXCEPT SPECIFIED.
3. REFER TO "CONSTRUCTION DETAILS (DWG NO. 2100811)" FOR STRUCTURAL DETAILS OF MEMBERS, ETC. EXCEPT SPECIFIED.
4. REFER TO "WELDING TABLE (DWG NO. 2100832)" FOR LEG LENGTH OF WELDING EXCEPT SPECIFIED.

備 考:-

1. 特記の他は，両舷対称とする。
2. 横断面図は，特記の他は後面を示す。
3. 構造詳細については，特記の他は「構造詳細図（図番2100811）」を参照のこと。
4. 溶接脚長については，特記の他は「溶接脚長表（図番2100832）」を参照のこと。

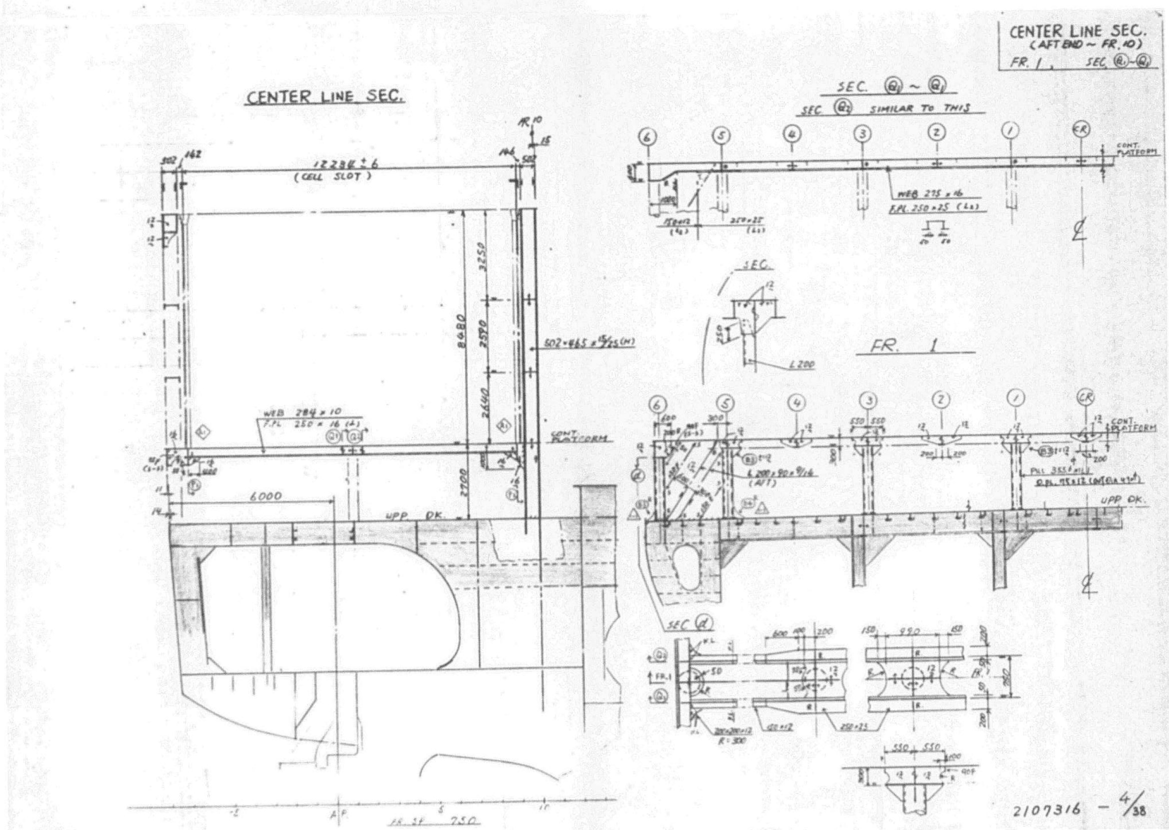
2107316-2/13

694

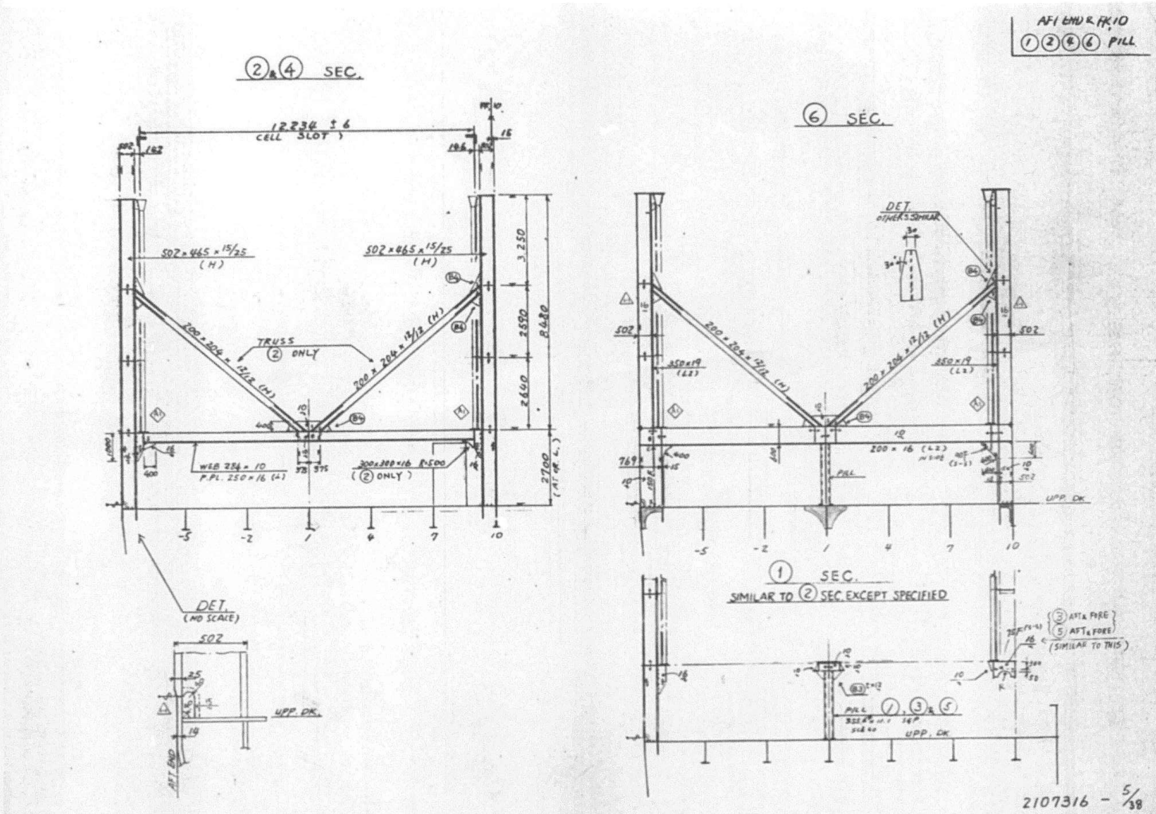
MATERIAL LIST

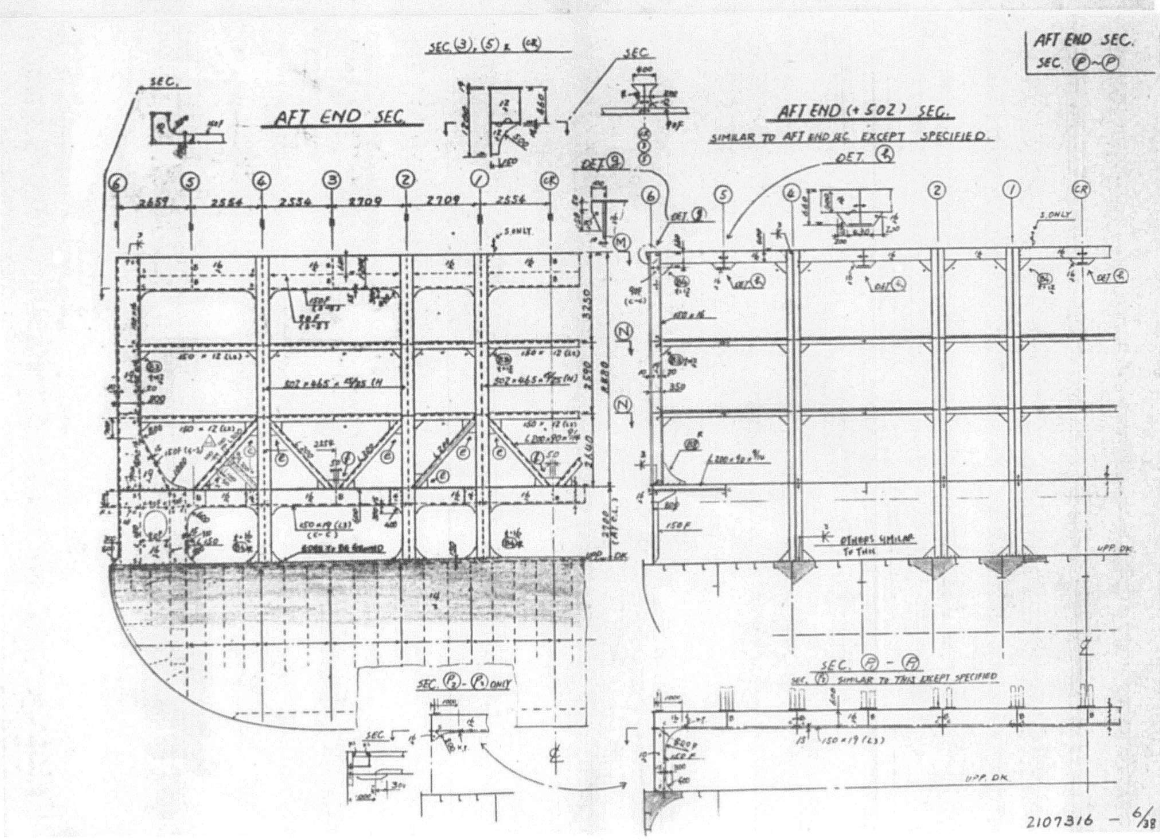
	ITEM	MTERIAL	NO	WT(TON) (ABT)
④	ENTRY GUIDE	(STEEL CASTING) SC42 (MAX CARBON 0.20%)	18	
⑤			36	

2107316 - 3/38

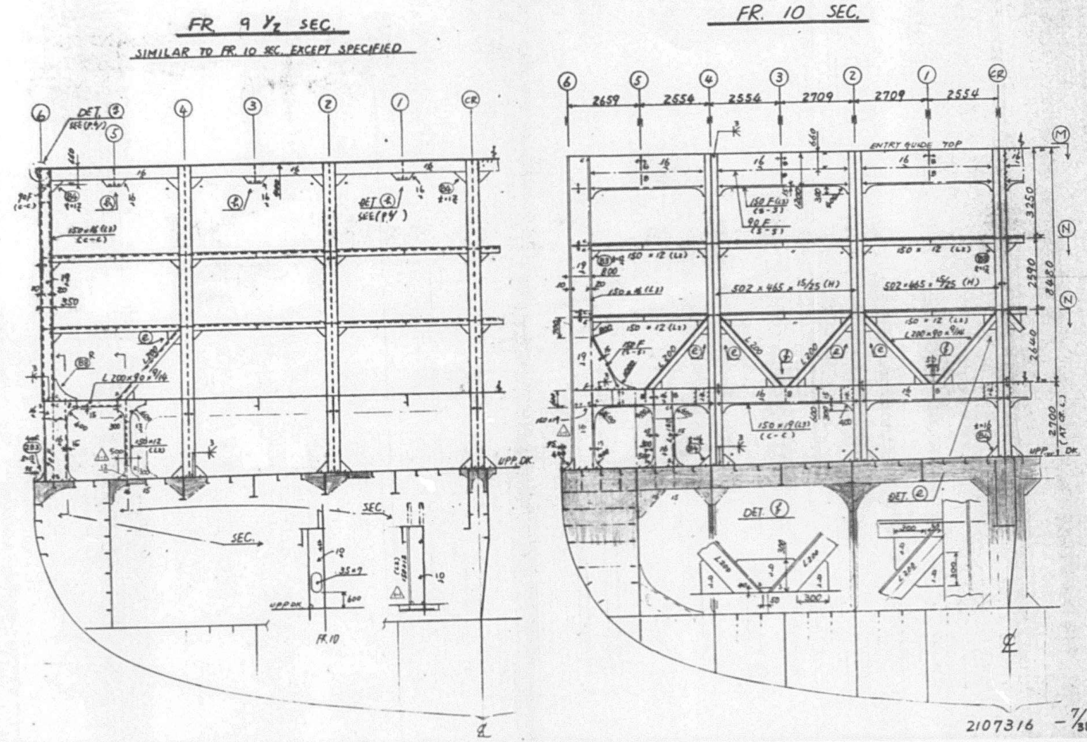


2107316 - 4/38


AFT END & FR.10
①②④⑥ PILL
②&④ SEC.
⑥ SEC.
TRUSS
② ONLY
DET.
(NO SCALE)
① SEC.
SIMILAR TO ② SEC. EXCEPT SPECIFIED
UPP. DK.
2107316 - 5/38

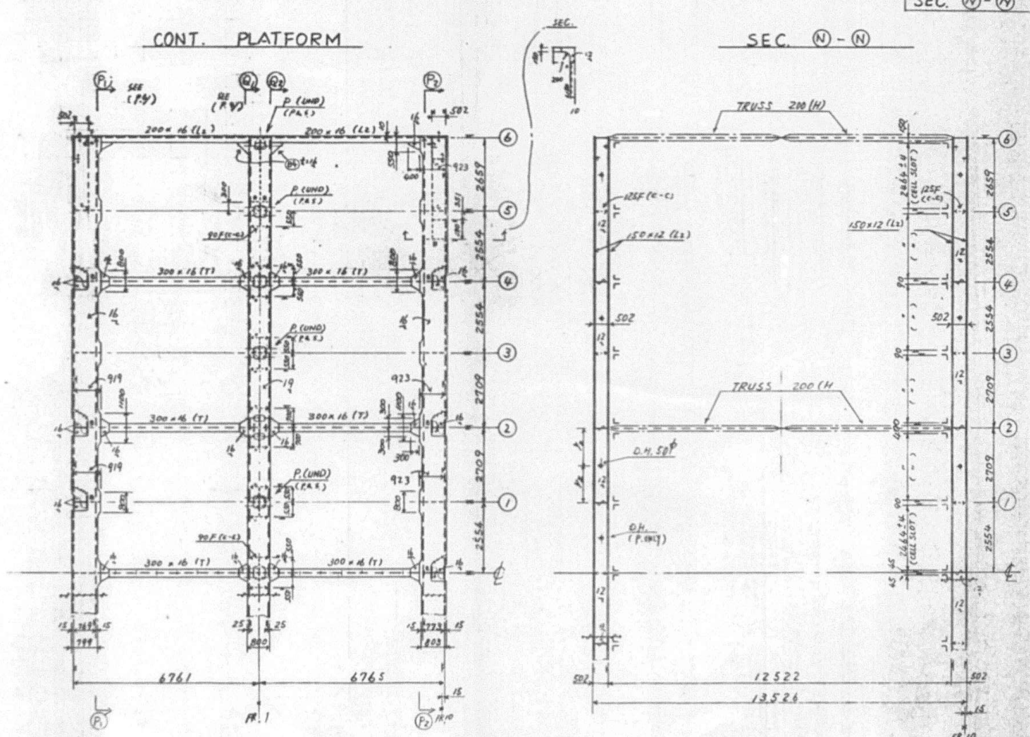

AFT END SEC.
SEC. Ⓟ~Ⓟ
AFT END SEC.
SEC.③, ⑤ & ㊌
AFT END (+502) SEC.
SIMILAR TO AFT END SEC. EXCEPT SPECIFIED.
OTHERS SIMILAR TO THIS
SEC. Ⓟ - Ⓟ
SEC. Ⓟ₂ - Ⓟ₃ ONLY
UPP. DK.
2107316 - 6/38

FR. 7 1/2 SEC.
FR. 10 SEC.



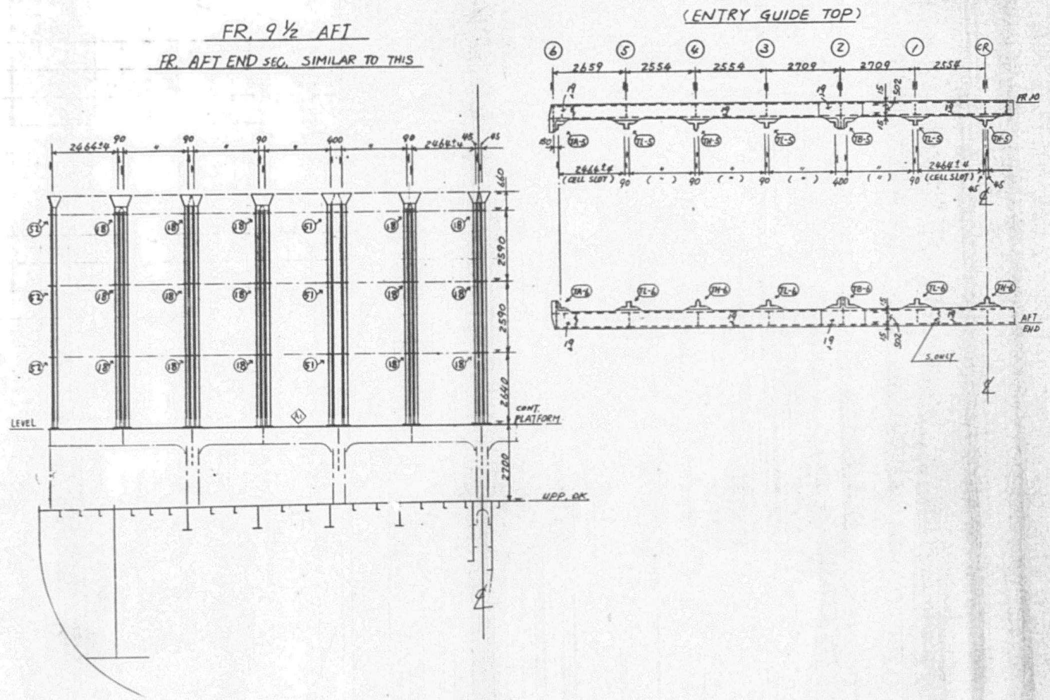
2107316 – 7/38

CONT. PLATFORM
SEC. Ⓝ-Ⓝ



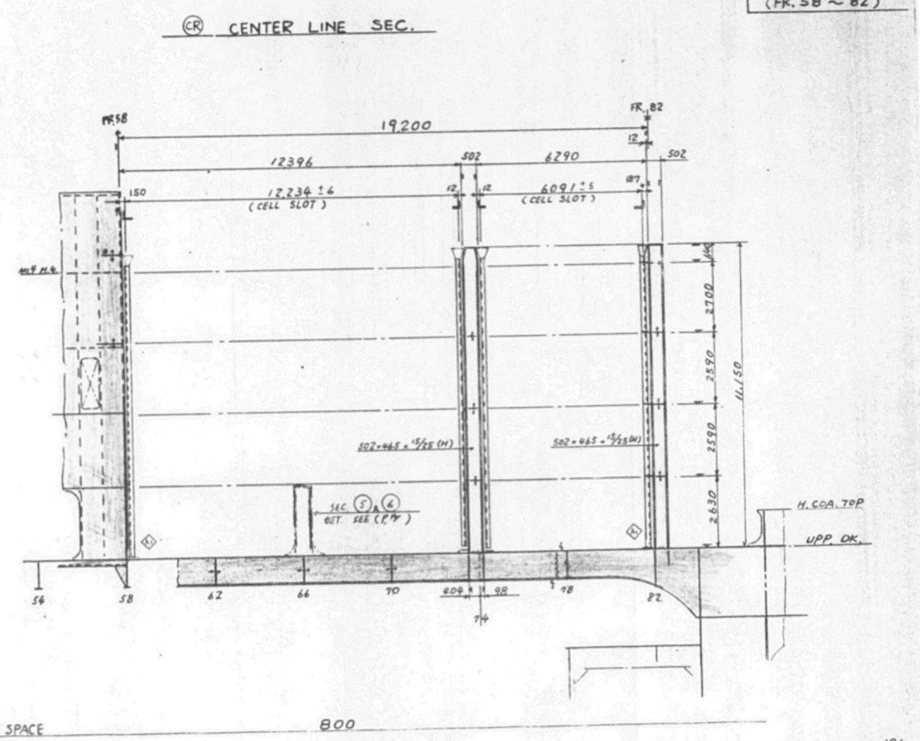
2107316 – 8/38

FR. 9½ AFT
SEC. Ⓜ-Ⓜ

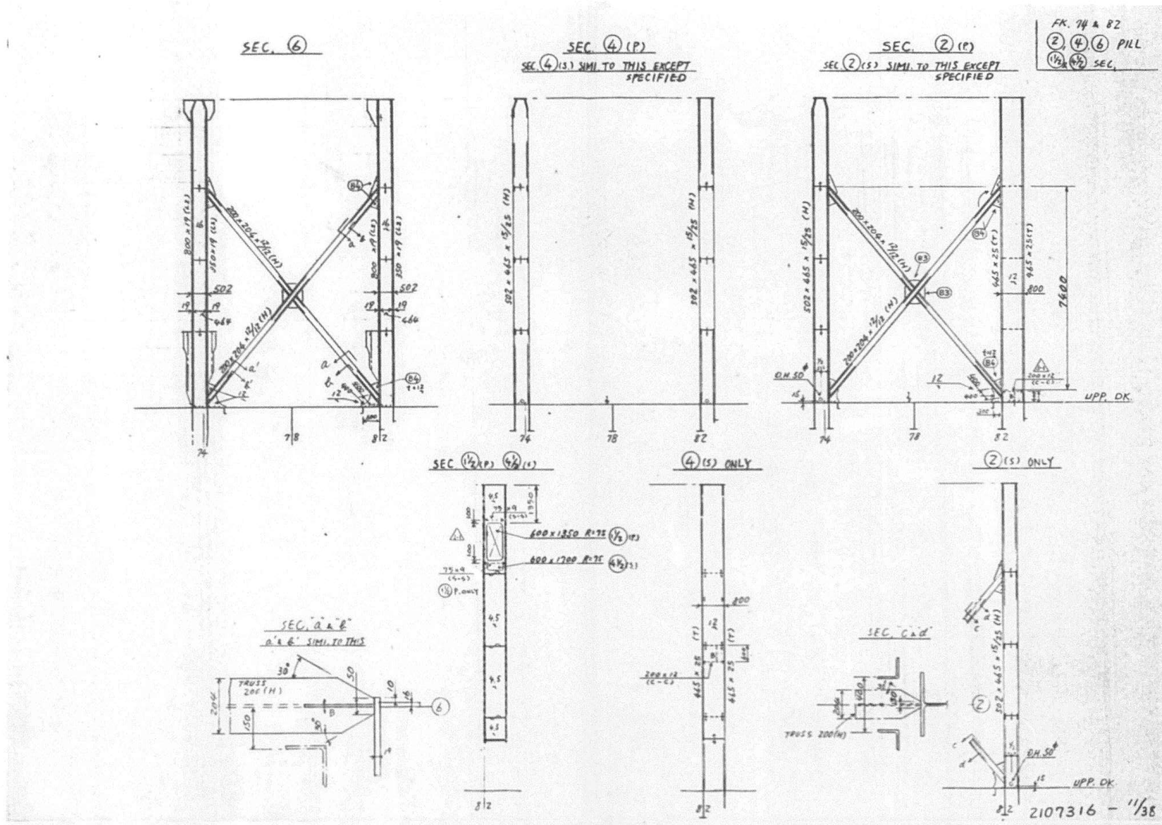


2107316 - 9/38

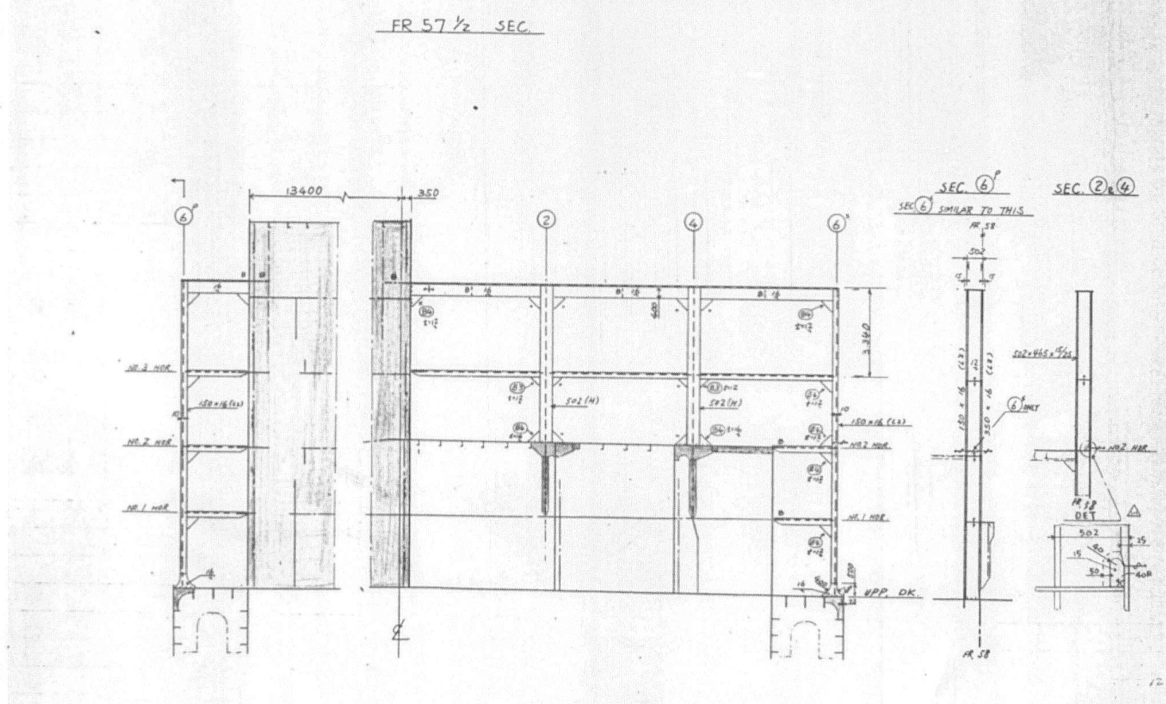
CENTER LINE SEC.
(FR. 58 ~ 82)



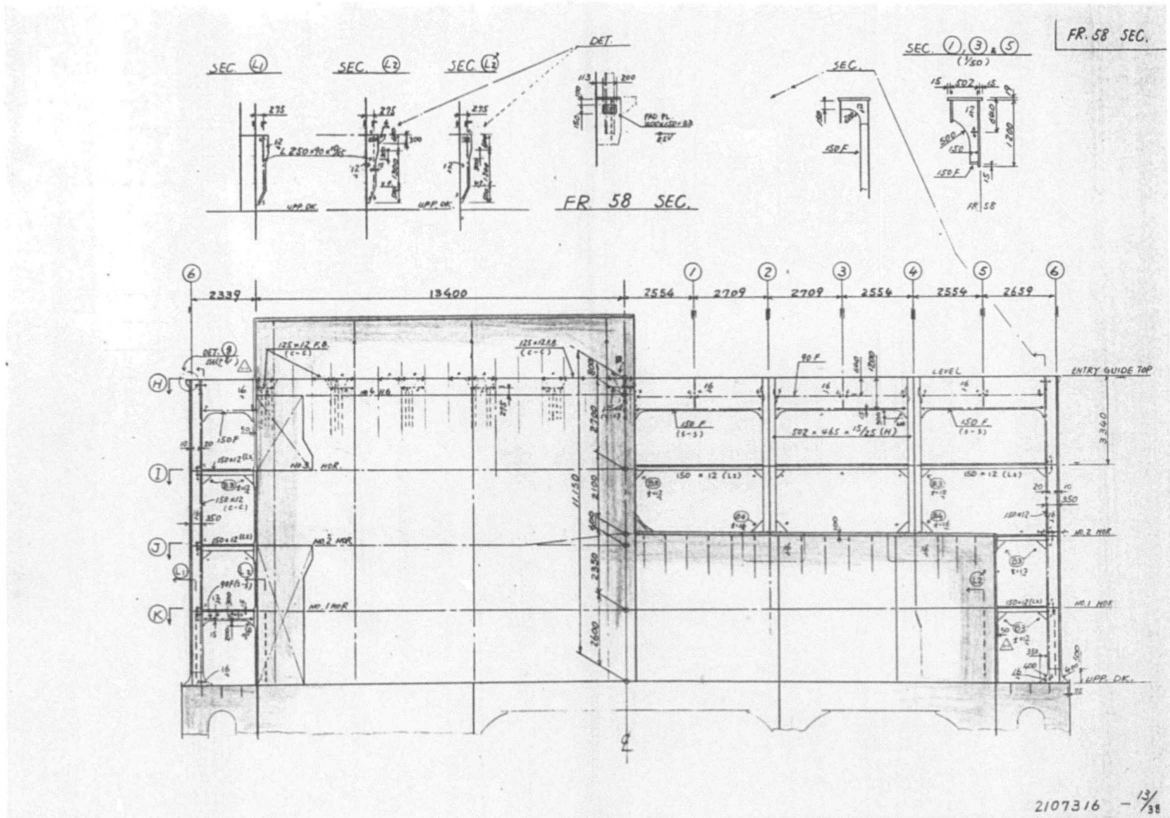
2107316 - 10/38

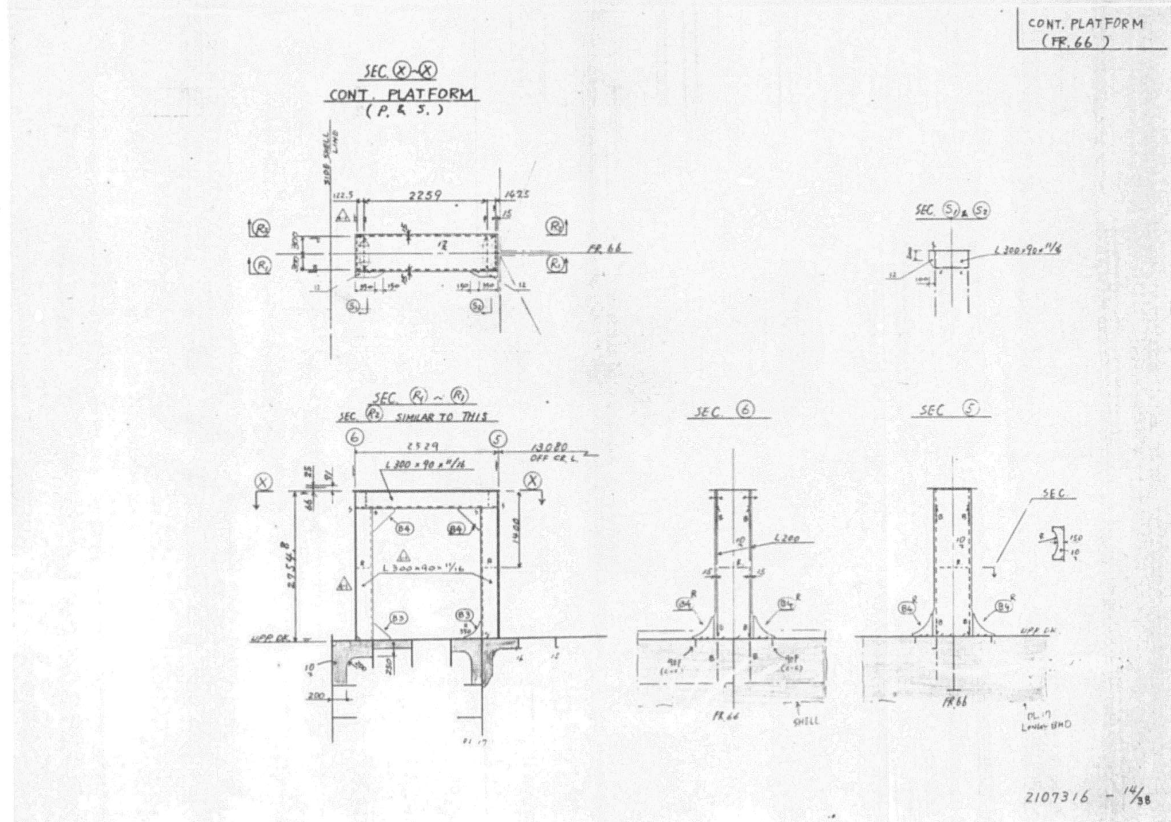


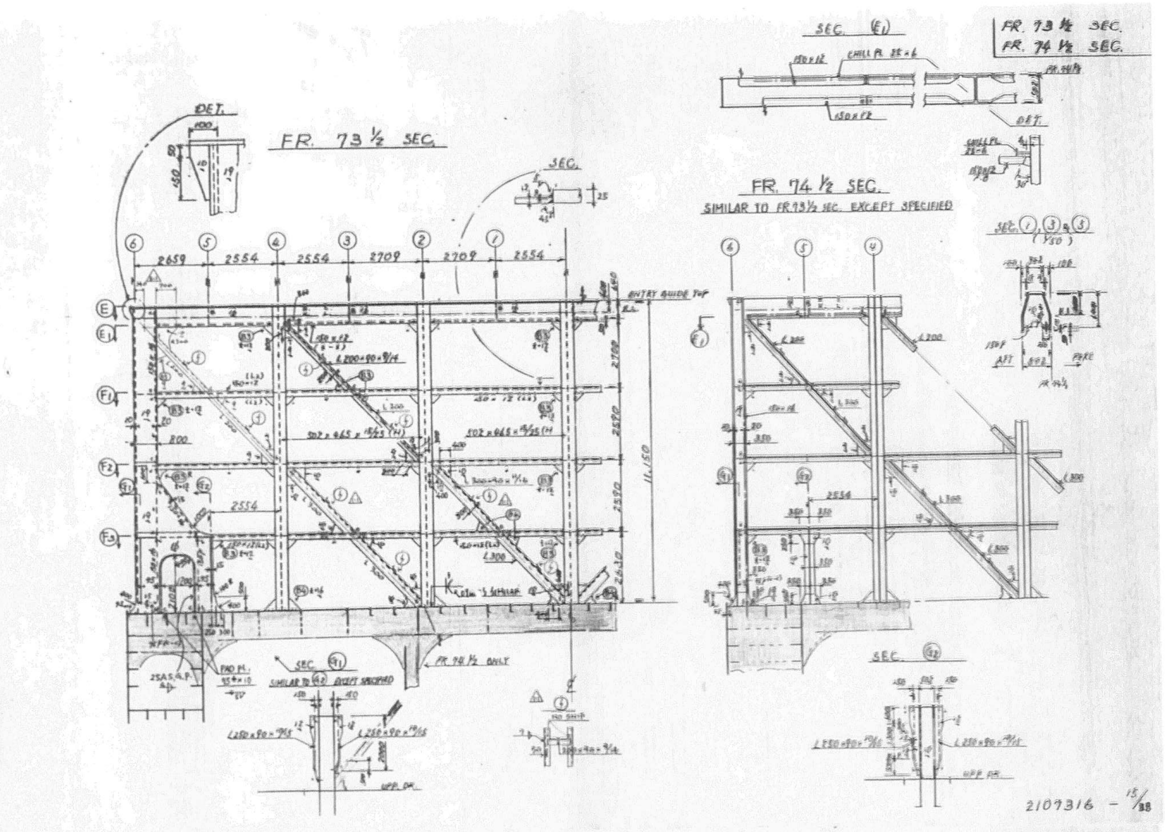
FR. 57½ SEC.

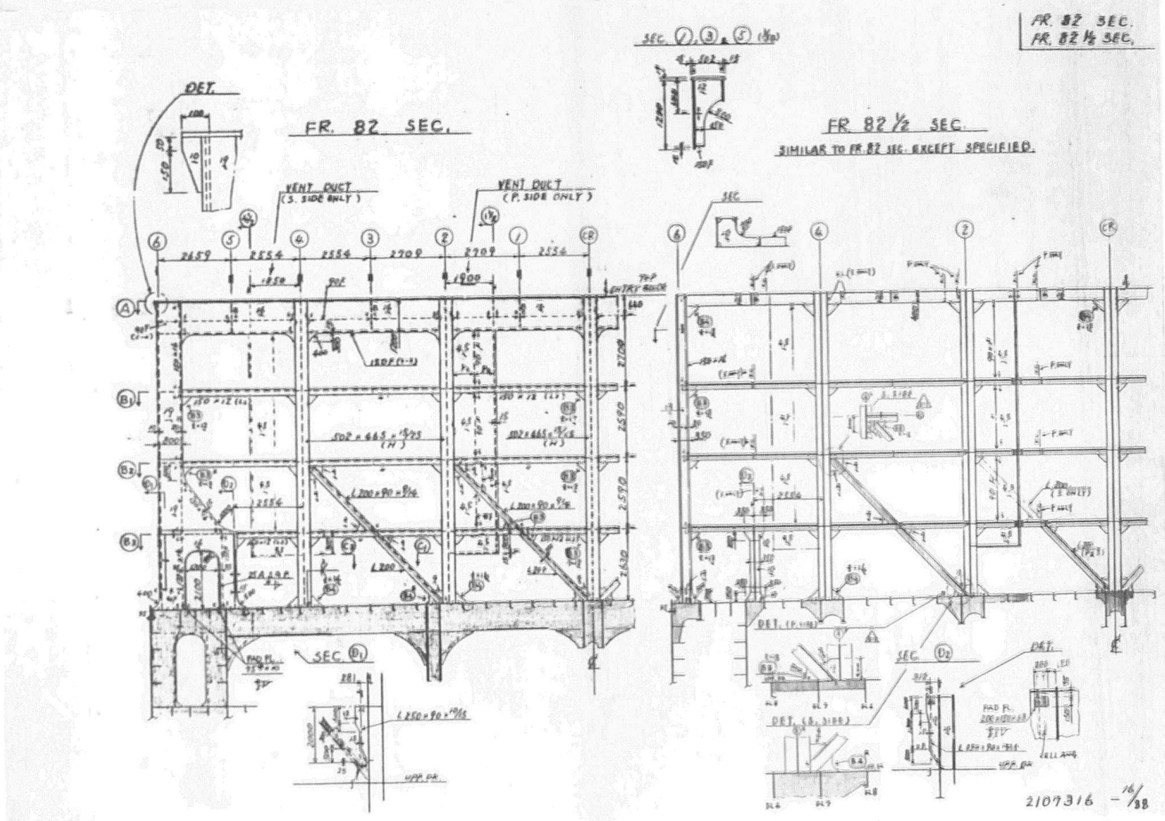


2107316 – 12/38

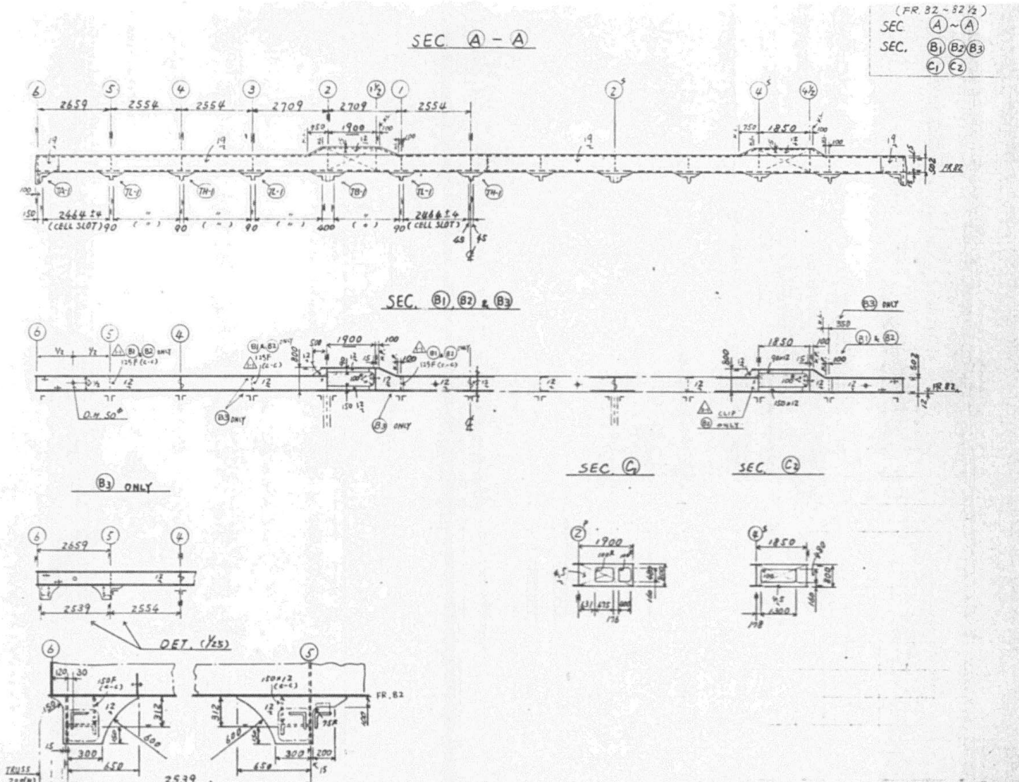

FR. 58 SEC.
SEC. (L1)
SEC. (L2)
SEC. (L3)
DET.
SEC.
SEC. (1), (3) & (5)
(1/50)
FR 58 SEC.
2339
13400
2554
2709
2709
2554
2554
2659
ENTRY GUIDE TOP
LEVEL
NO. 3 HOR.
NO. 2 HOR.
NO. 1 HOR.
UPP. DK.
2107316 - 13/38


CONT. PLATFORM
(FR. 66)
SEC. (X)-(X)
CONT. PLATFORM
(P. & S.)
2259
FR. 66
SEC. (S1) & (S2)
SEC. (R1) ~ (R1)
SEC. (R2) SIMILAR TO THIS
SEC. (6)
SEC. (5)
UPP. DK.
SHELL
FR. 66
2107316 - 14/38

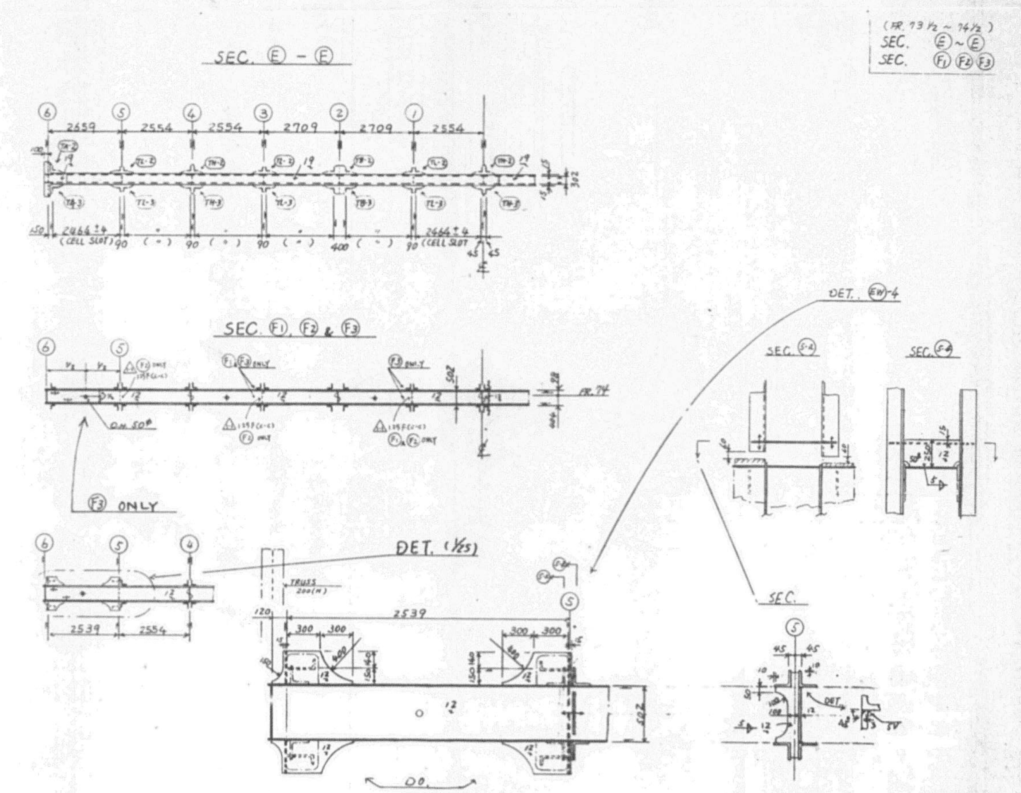

FR. 73 ½ SEC.
FR. 74 ½ SEC.
FR. 73 ½ SEC.
FR. 74 ½ SEC.
SIMILAR TO FR.73½ SEC. EXCEPT SPECIFIED
SEC. (E1)
SEC. (G1)
SEC. (G2)
DET.
ENTRY GUIDE TOP
11,150
2107316 - 15/38


FR. 82 SEC.
FR. 82 ½ SEC.
FR. 82 SEC.
FR. 82 ½ SEC.
SIMILAR TO FR.82 SEC. EXCEPT SPECIFIED.
VENT DUCT (S. SIDE ONLY)
VENT DUCT (P. SIDE ONLY)
SEC. (D1)
SEC. (D2)
DET.
2107316 - 16/38

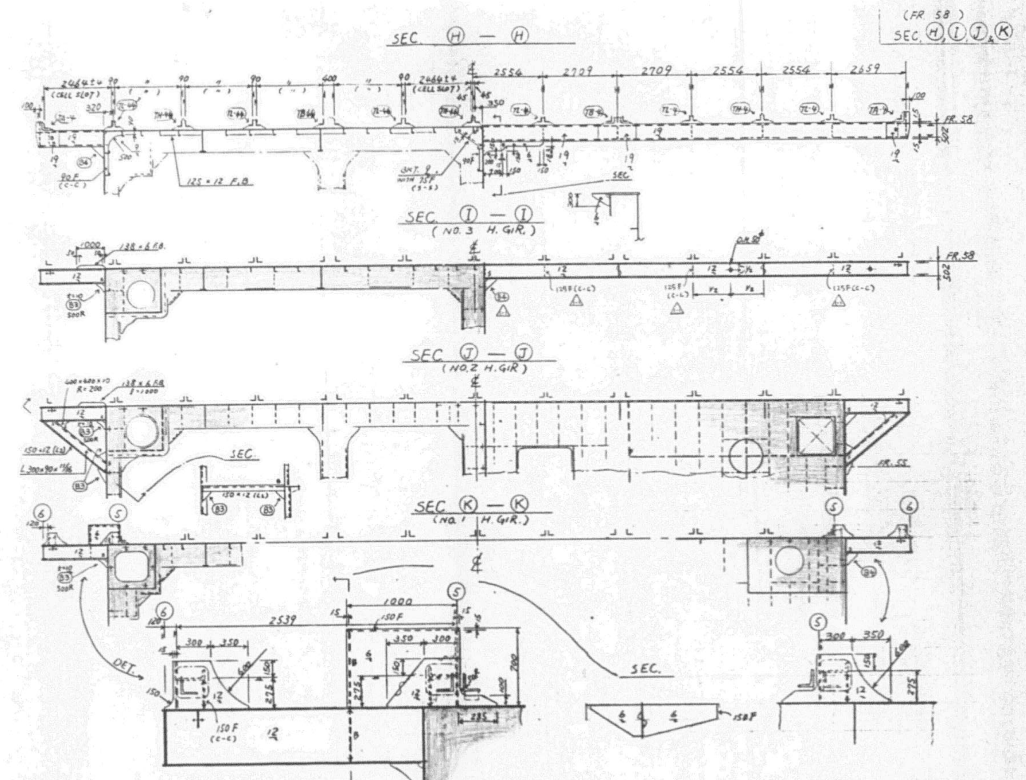
701



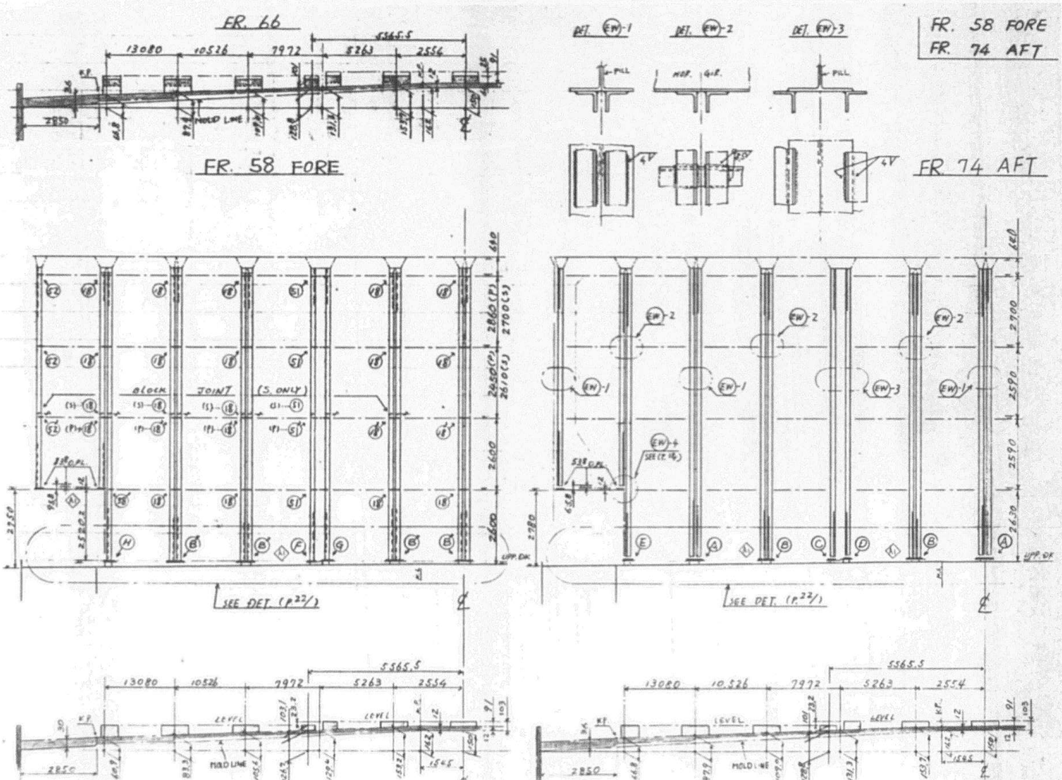
2107316 - 17/38



2107316 - 18/38

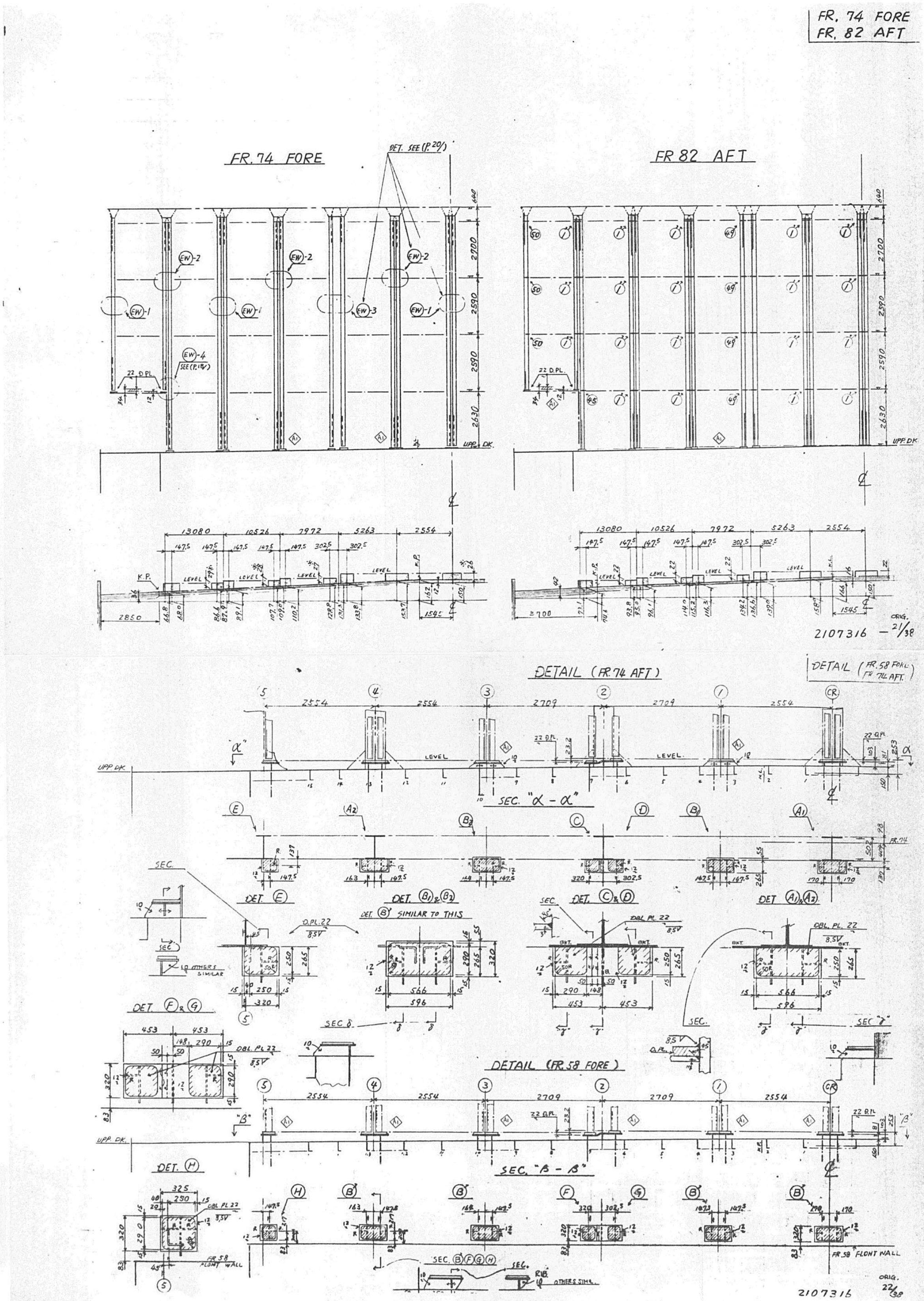


2107316 – 19/38



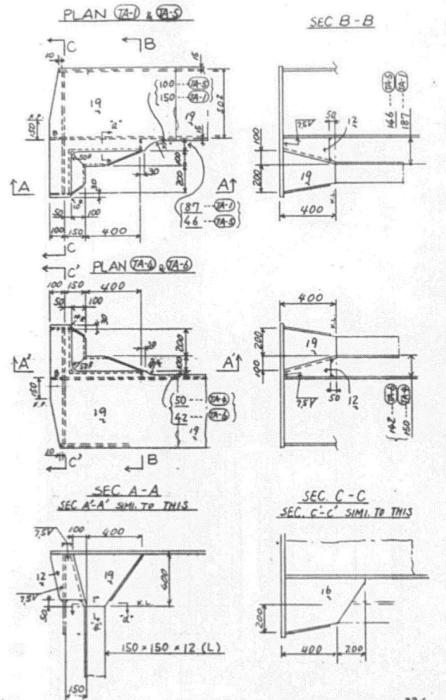
2107316 – 20/38

703



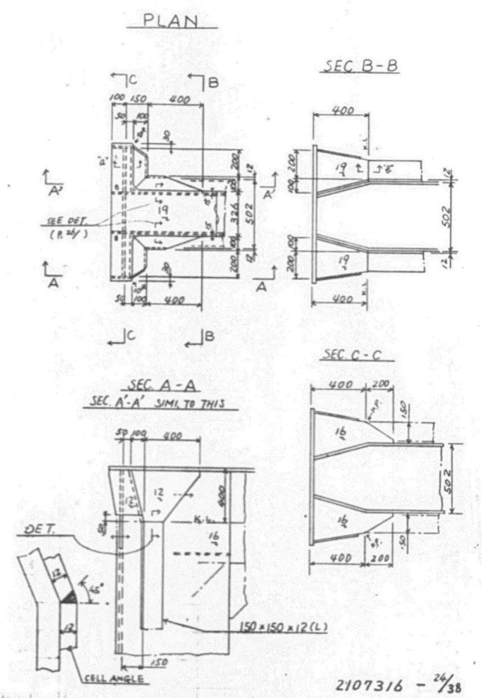
FR. 74 FORE
FR. 82 AFT
FR. 74 FORE
FR 82 AFT
DET. SEE (P.20/)
UPP. DK.
2107316 – 21/38
DETAIL (FR.74 AFT)
DETAIL (FR.58 FORE / FR.74 AFT)
SEC. "α - α"
DET. Ⓔ
DET. Ⓑ1 & Ⓑ2
DET. Ⓑ' SIMILAR TO THIS
DET. Ⓒ & Ⓓ
DET. Ⓐ1 & Ⓐ2
DET. Ⓕ & Ⓖ
DETAIL (FR.58 FORE)
SEC. "β - β"
DET. Ⓗ
FR.58 FLONT WALL
2107316 22/38

TA-1, TA-5, TA-4 & TA-6 ENTRY GUIDE



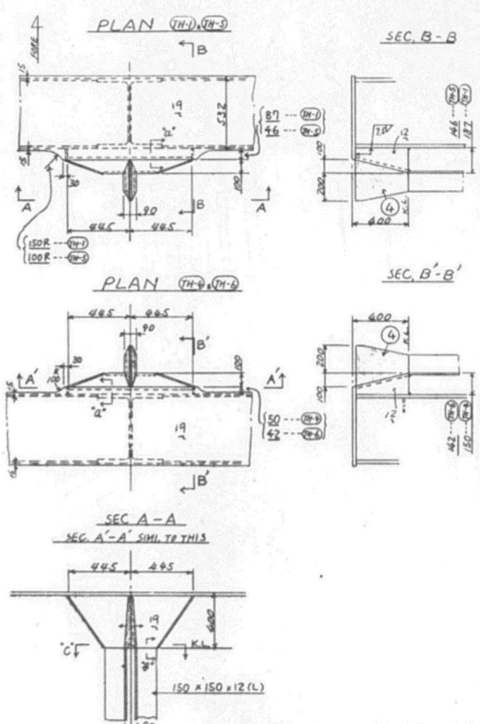
2107316 - 23/38

TA-2 & TA-3 ENTRY GUIDE



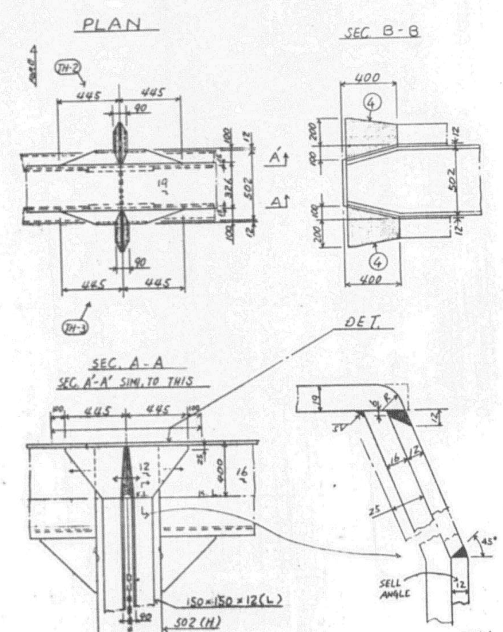
2107316 - 24/38

TH-1, TH-5, TH-4 & TH-6 ENTRY GUIDE



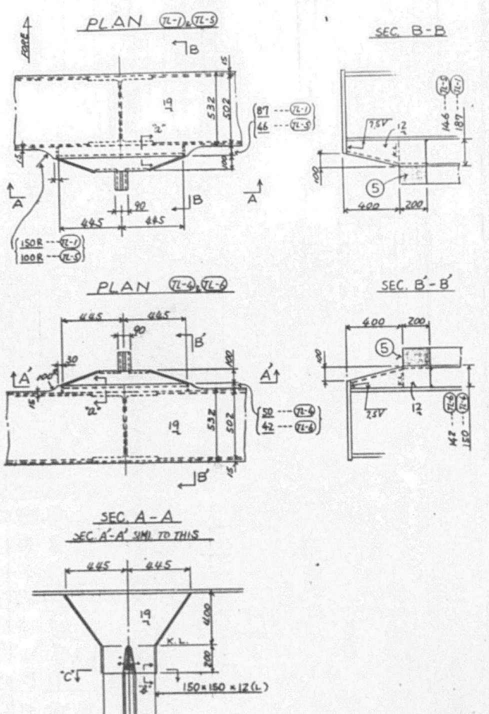
2107316 - 25/38

TH-2 & TH-3 ENTRY GUIDE



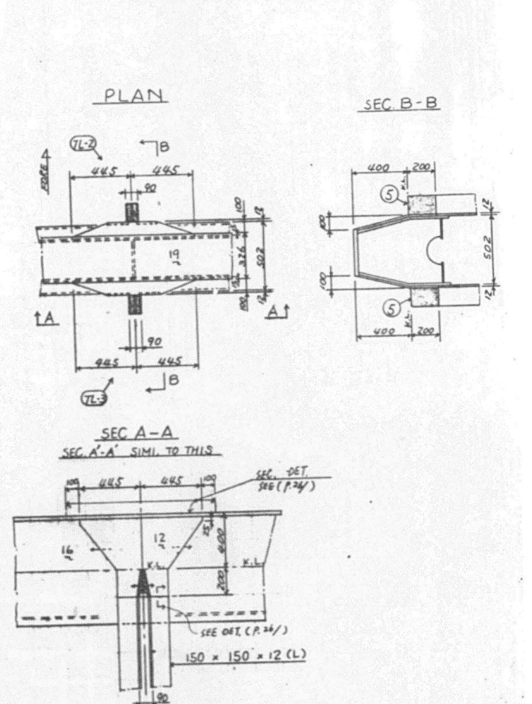
2107316 - 26/38

TL-1, TL-5, TL-4 & TL-6 ENTRY GUIDE



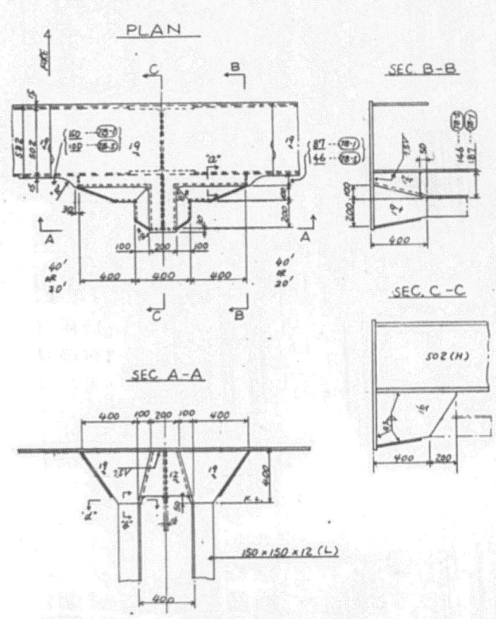
2107316 – 27/38

TL-2 & TL-3 ENTRY GUIDE



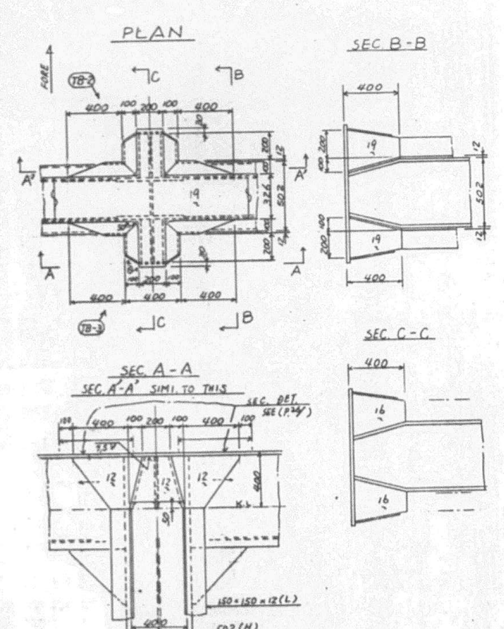
2107316 – 28/38

TB-1 & TB-5 ENTRY GUIDE



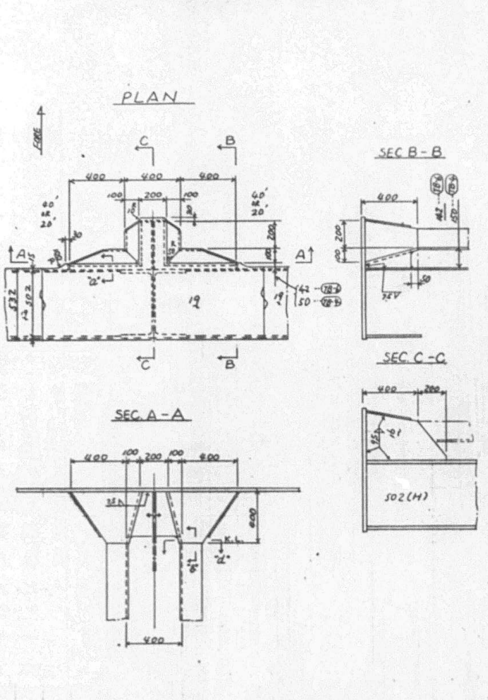
2107316 – 29/38

TB-2 & TB-3 ENTRY GUIDE



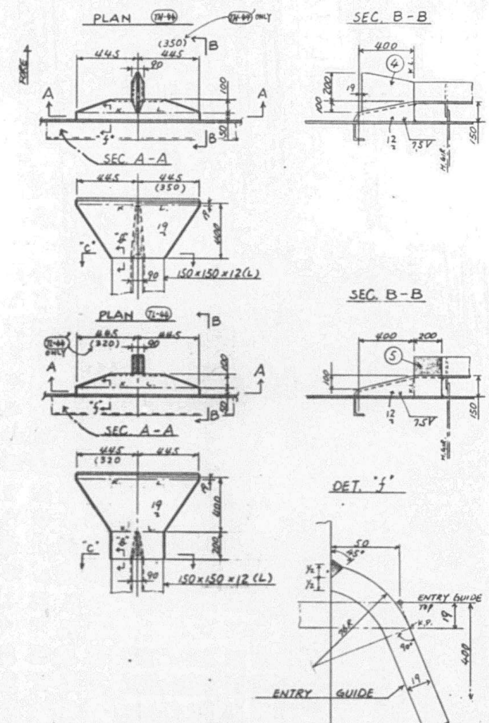
2107316 – 30/38

TB-4 & TB-6 ENTRY GUIDE



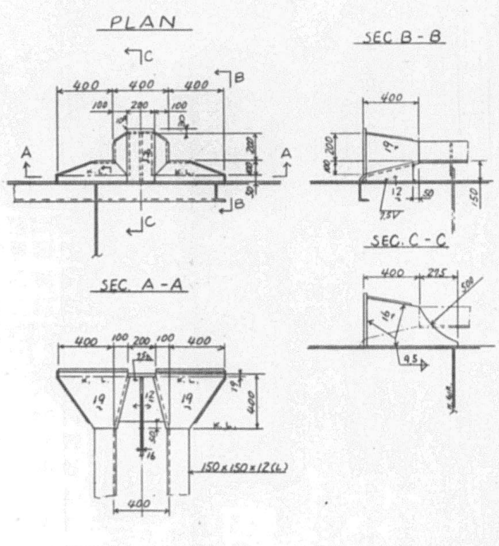
2107316 – 31/38

TH-44 & TL-44 ENTRY GUIDE



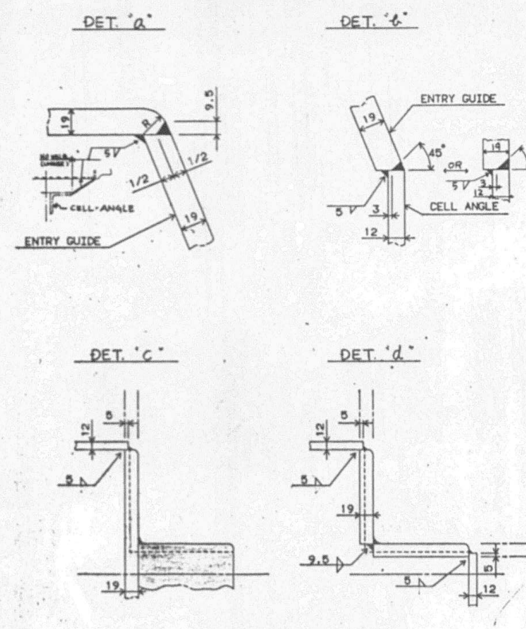
2107316 – 32/38

TB-44 ENTRY GUIDE



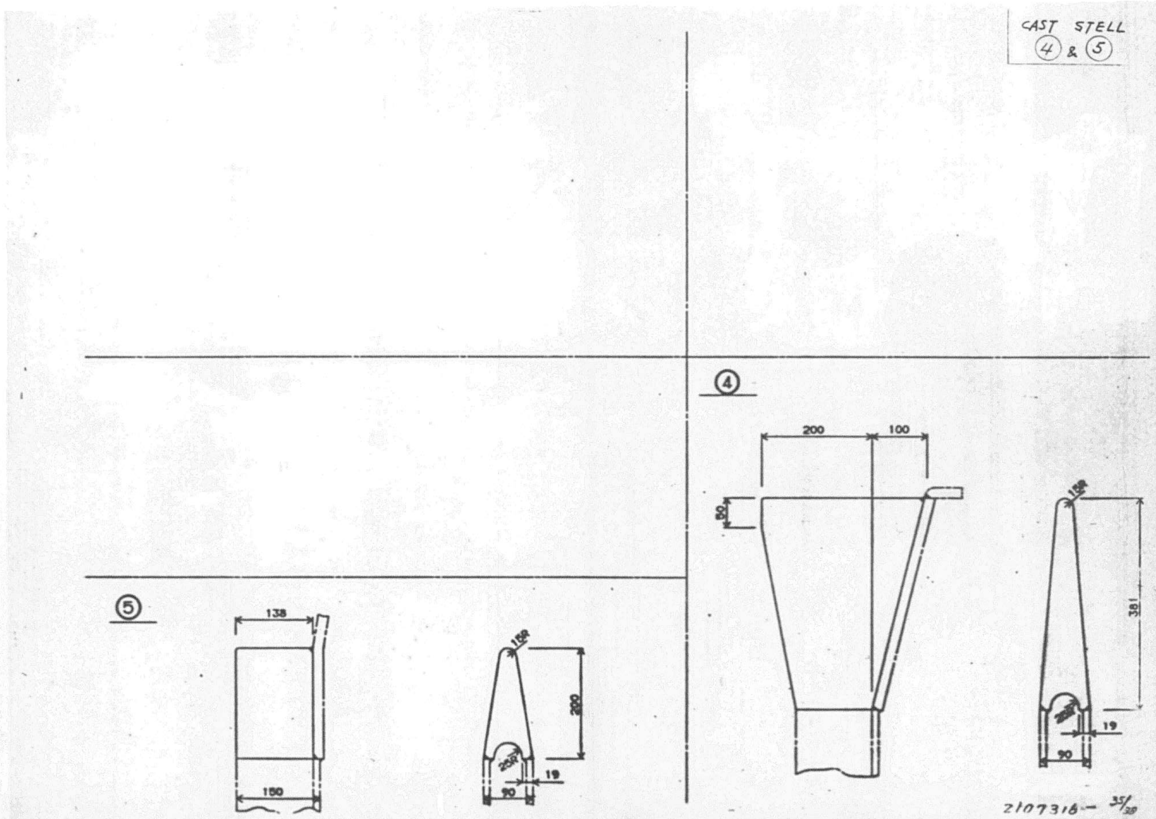
2107316 – 33/38

DETAIL OF ENTRY GUIDE

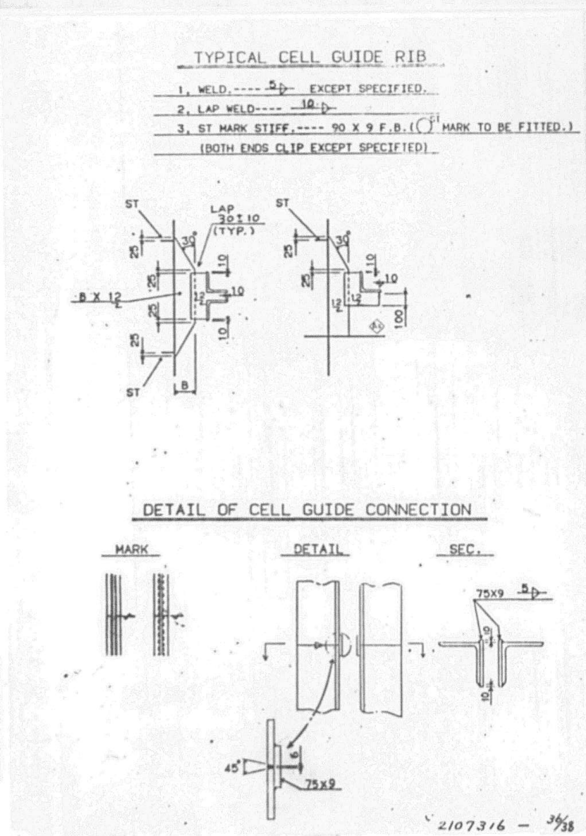


2107316 – 34/38

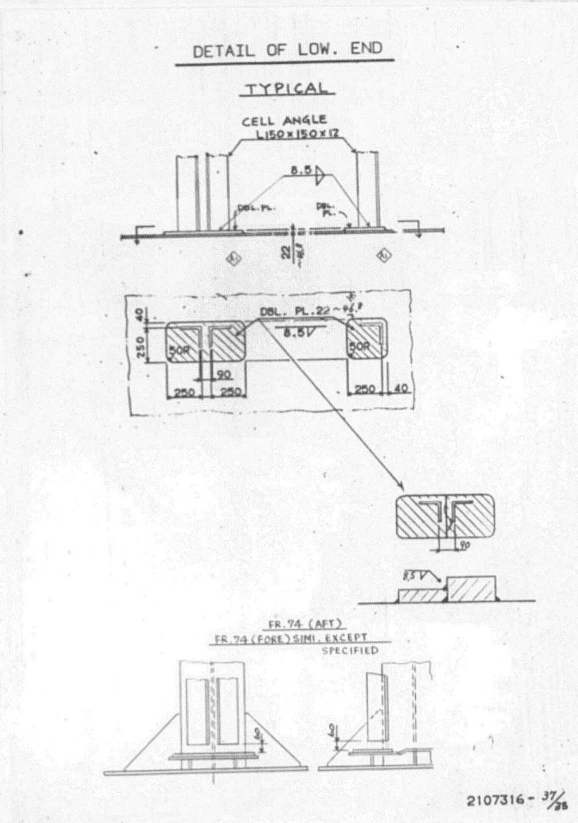
707



CAST STELL
4 & 5
4
200
100
50
381
19
90
15R
5
138
150
200
19
90
2107316 - 35/38

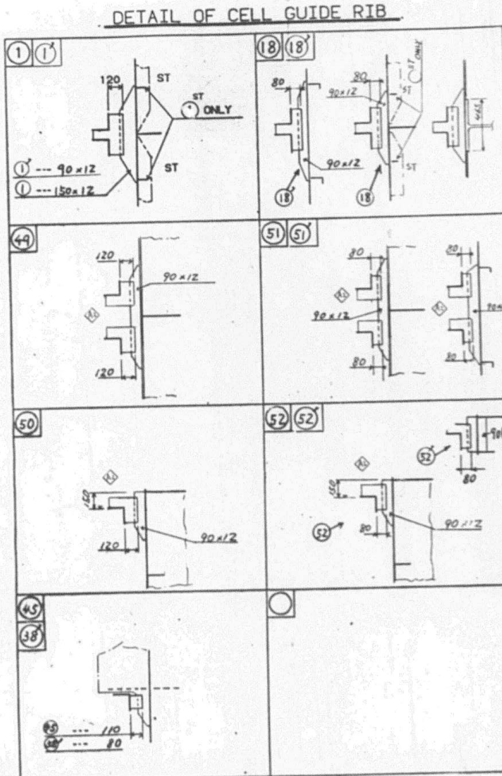


TYPICAL CELL GUIDE RIB
1. WELD.---- 5 EXCEPT SPECIFIED.
2. LAP WELD---- 10
3. ST MARK STIFF.---- 90 X 9 F.B.(MARK TO BE FITTED.)
(BOTH ENDS CLIP EXCEPT SPECIFIED)
ST
LAP
30±10
(TYP.)
B X 12
ST
DETAIL OF CELL GUIDE CONNECTION
MARK
DETAIL
SEC.
75X9
45°
75X9
2107316 - 36/38



DETAIL OF LOW. END
TYPICAL
CELL ANGLE
L150×150×12
8.5
DBL. PL.
DBL. PL.22
8.5
50R
90
250
40
FR.74 (AFT)
FR.74 (FORE) SIMI. EXCEPT SPECIFIED
2107316 - 37/38

DETAIL OF CELL GUIDE RIB



2107316 - 33/AR

APPROVAL OF OWNER & REGULATORY BODIES

ALT.NO.	OWNER DATE	OWNER LETTER NO.	USCG DATE	USCG LETTER NO.	ABS DATE	ABS LETTER NO.	USPH DATE	USPH LETTER NO.
ORIGINAL	AUG.2.'85	OFTZ/MES-354			8. OCT '86	77/59 7-2-2		
REV.-1		TRH/101			—	—		

FINISHEDPLAN

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SHIPYARD AND SHIP'S NO. & NAME			
MITSUI TAMANO		MITSUBISHI KOBE	
NO.1323	DOCTOR LYKES	NO.1158	JAMES LYKES
NO.1324	ALMERIA LYKES	NO.1159	JOSEPH LYKES
NO.1325	TILLIE LYKES	NO.1164	SOLON TURMAN

MITSUI ENGINEERING & SHIPBUILDING CO.,LTD.
TAMANO WORKS

SHIP DESIGN DEPARTMENT MANAGER

SHIP'S NO. **NO.1325** SHIP'S NAME **TILLIE LYKES**

OUTFITTING DESIGN SECTION

CONTAINER POST

STAFF

DATE

JOB NO. TS1323/24/25 JOBCLASSIF.NO.

SCALE ~

LYKES REF. NO. 120509

MITSUI DRAWING NO. 4104335

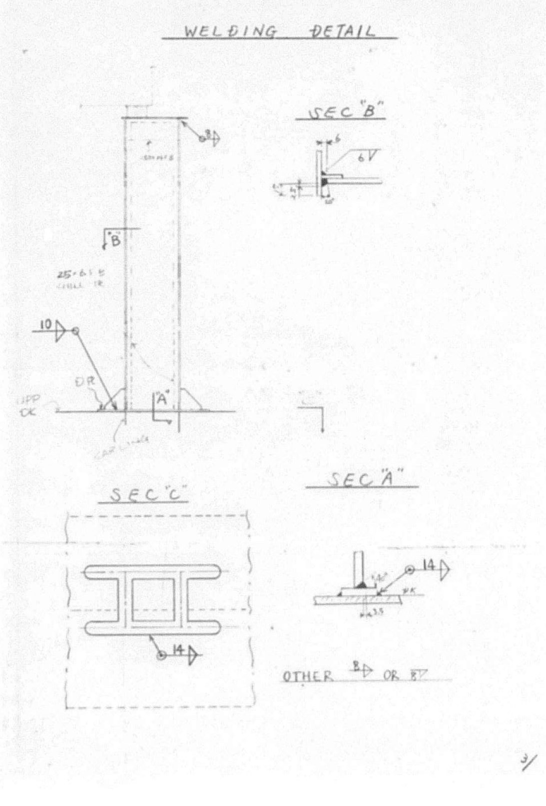
(18 SHEETS WITH COVER)

1/18

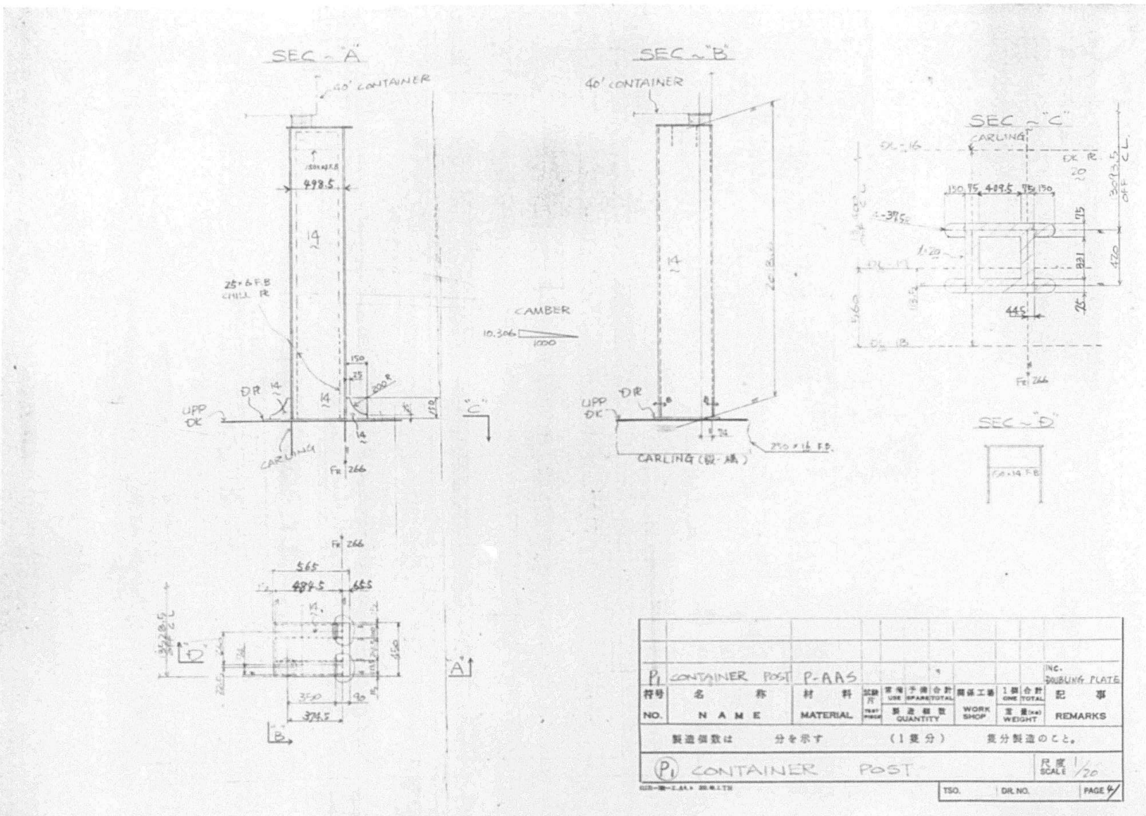
PLAN RECORD

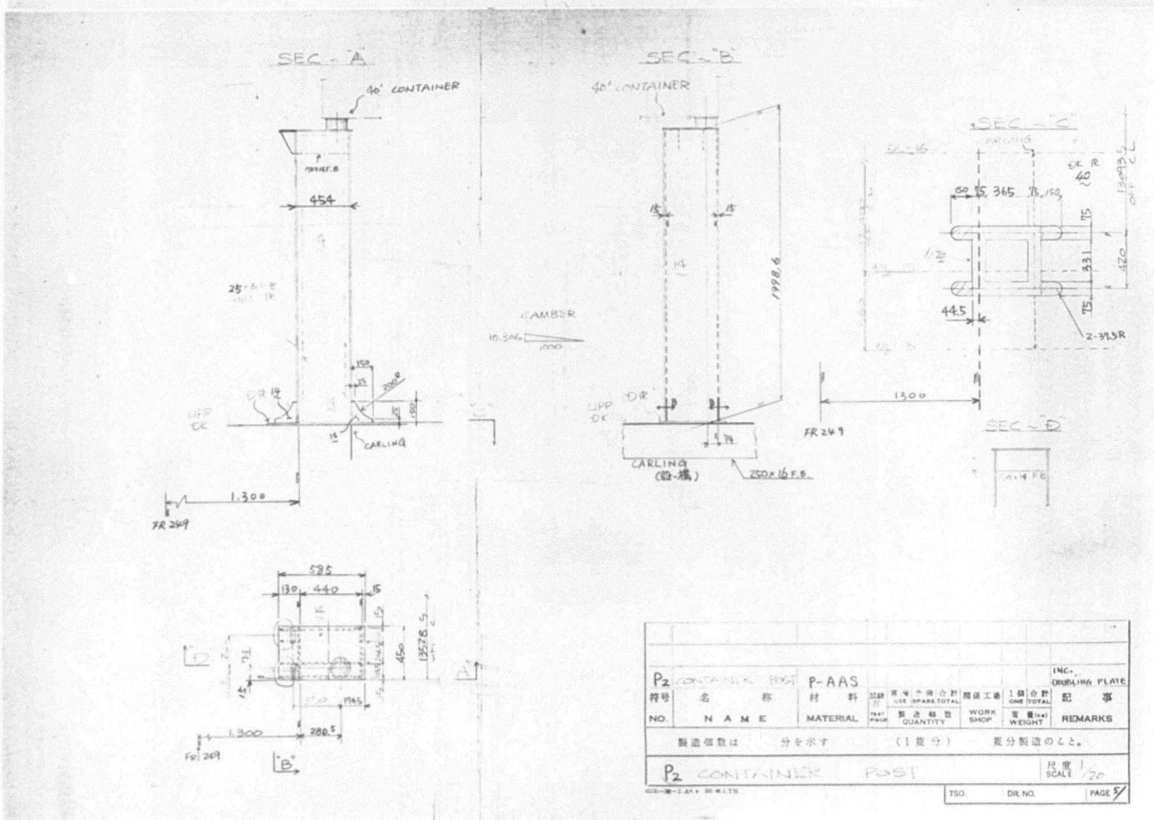
ALT.NO.	MARK	ALTERATION/DESCRIPTION	DATE & SIGNATURE
1		PREPARED FOR S.NO.1323 AS FINISHED PLAN, MADE APPLICABLE TO S.NO.1324 AND S.NO.1325.	NOVEMBER 20.'86

DWG.NO.

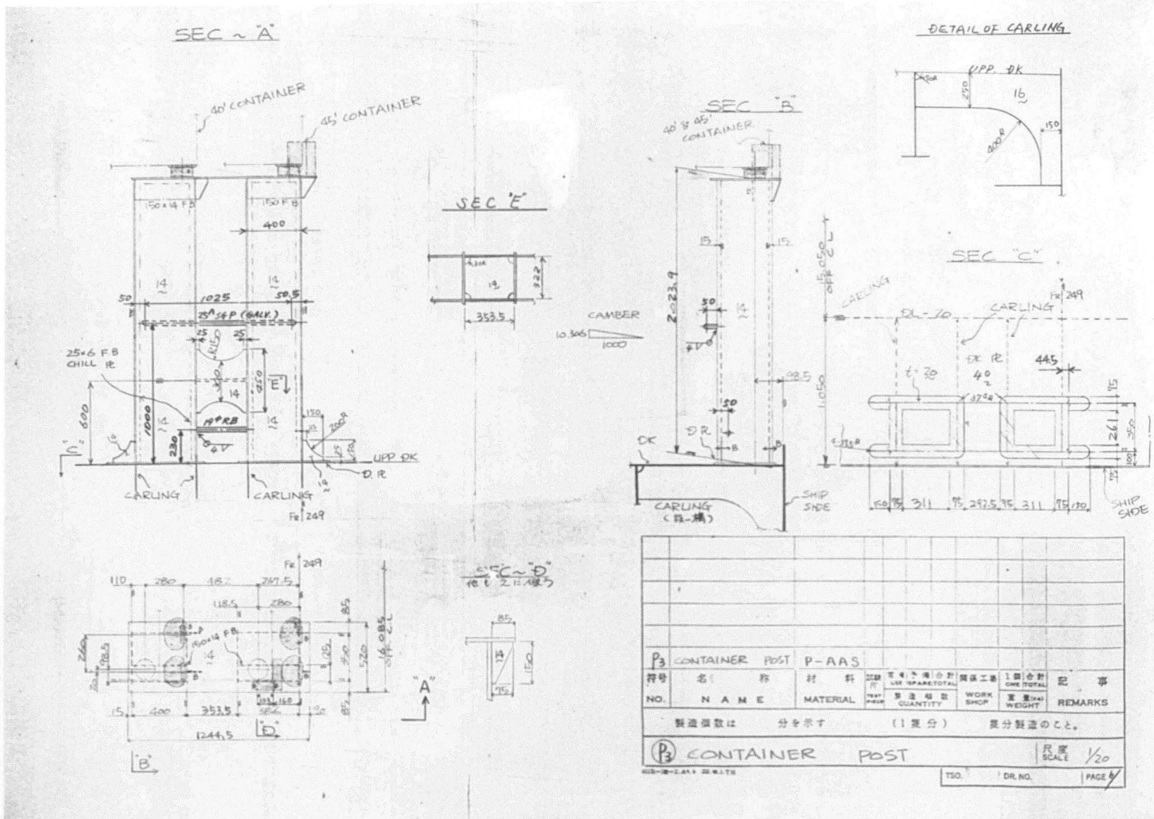


3/

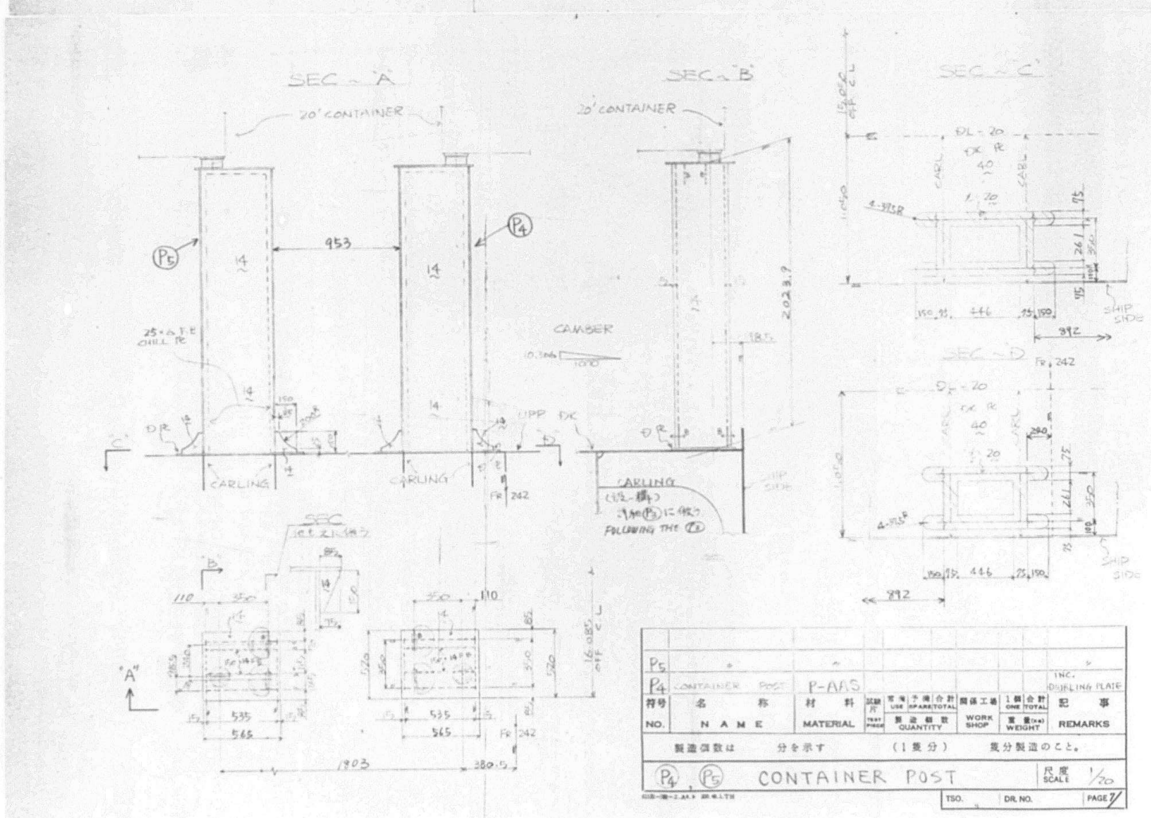

SEC - "A"
40' CONTAINER
998.5
25×6 F.B
UPP DK
CARLING
FR 266
SEC - "B"
40' CONTAINER
CARLING (縦-構)
250×16 F.B.
CAMBER
10.306
1000
SEC - "C"
CARLING
SEC - "D"
565
484.5
350
374.5
P1 CONTAINER POST
P-AAS
INC. DOUBLING PLATE
符号 NO.
名 称 NAME
材 料 MATERIAL
QUANTITY
WORK SHOP
WEIGHT
記 事 REMARKS
製造個数は 分を示す (1隻分) 隻分製造のこと。
P1 CONTAINER POST
尺度 SCALE 1/20
TSO.
DR.NO.
PAGE 4/


SEC - "A"
40' CONTAINER
454
UPP DK
CARLING
1.300
FR 249
SEC - "B"
40' CONTAINER
1998.6
CARLING (縦-構)
250×16 F.B.
CAMBER
10.306
1000
SEC - "C"
150 75 365 75 150
420
44.5
2-37.5R
1300
FR 249
SEC - "D"
585
130 440 15
450
13578.5
1.300
280.5
FR 249
P2 CONTAINER POST
P-AAS
INC. DOUBLING PLATE
符号 NO.
名 称 NAME
材 料 MATERIAL
QUANTITY
WORK SHOP
WEIGHT
記 事 REMARKS
製造個数は 分を示す (1隻分) 隻分製造のこと。
P2 CONTAINER POST
尺度 SCALE 1/20
TSO.
DR.NO.
PAGE 5/

711

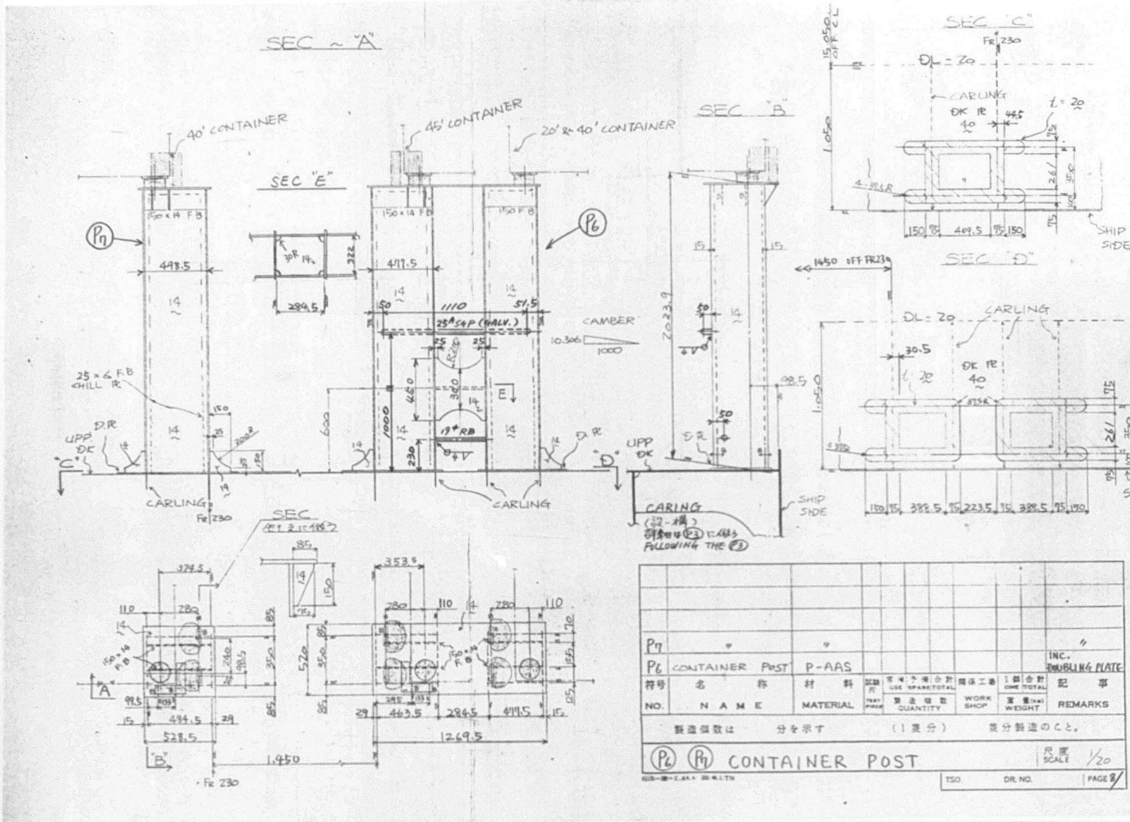


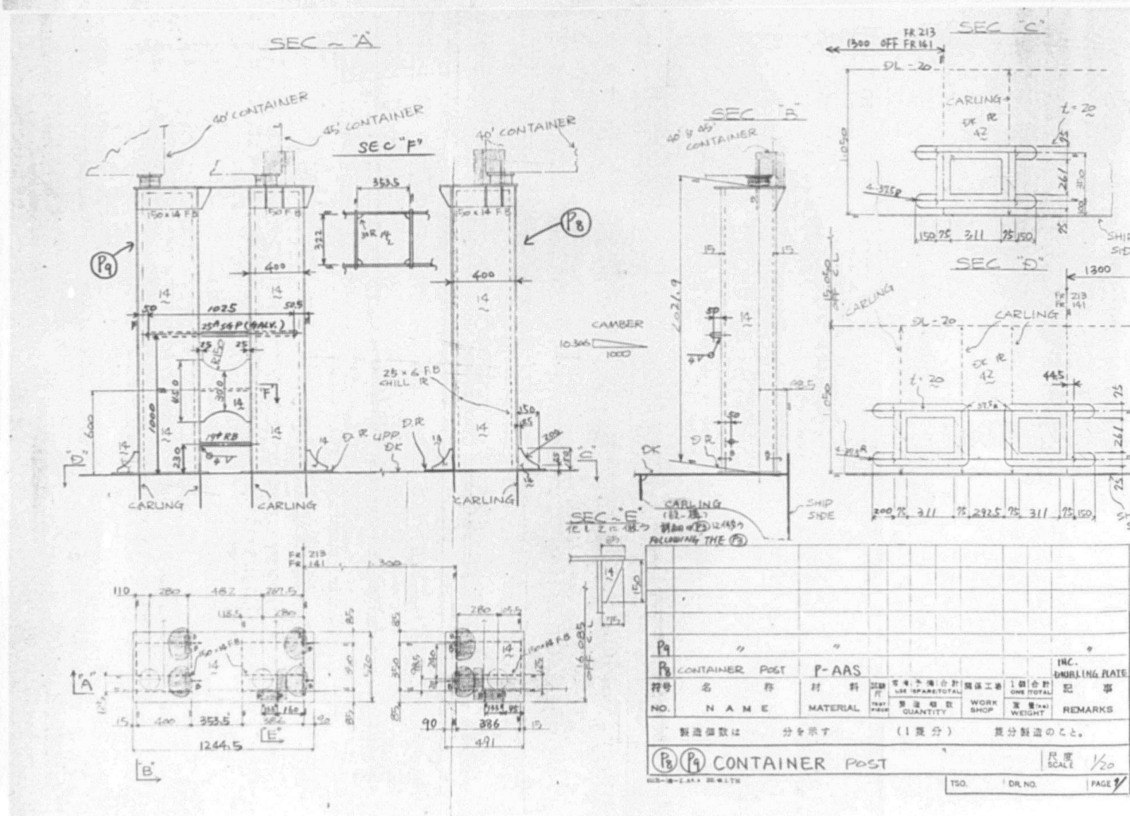
SEC ~ "A"
40' CONTAINER
45' CONTAINER
CARLING
UPP DK
SEC "E"
SEC "B"
40' & 45' CONTAINER
CAMBER
DETAIL OF CARLING
SEC "C"
SHIP SIDE
P3 CONTAINER POST P-AAS
符号 NO.
名称 NAME
材料 MATERIAL
REMARKS
P3 CONTAINER POST
尺度 SCALE 1/20
TSO. DR. NO. PAGE 6



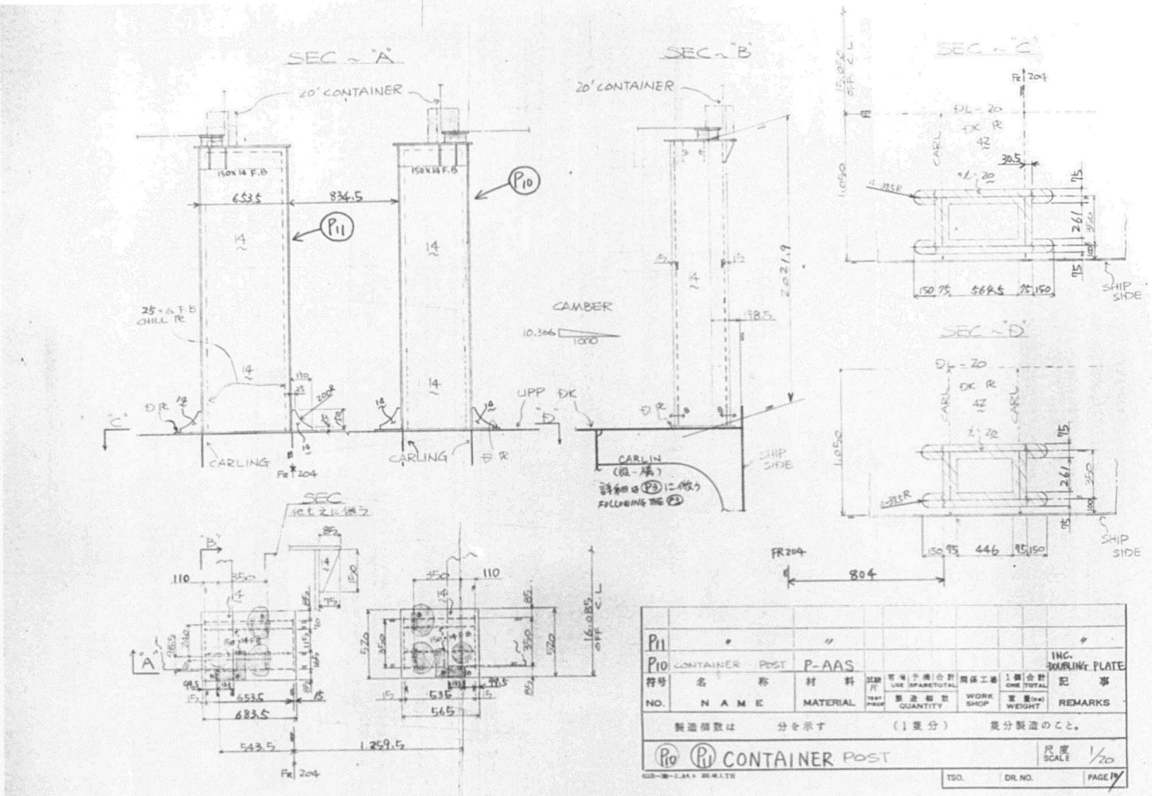
SEC ~ "A"
20' CONTAINER
SEC ~ "B"
SEC ~ "C"
SEC ~ "D"
CAMBER
CARLING
UPP DK
FOLLOWING THE P5
SHIP SIDE
P5
P4 CONTAINER POST P-AAS
INC. DOUBLING PLATE
符号 NO.
名称 NAME
材料 MATERIAL
REMARKS
P4 P5 CONTAINER POST
尺度 SCALE 1/20
TSO. DR. NO. PAGE 7

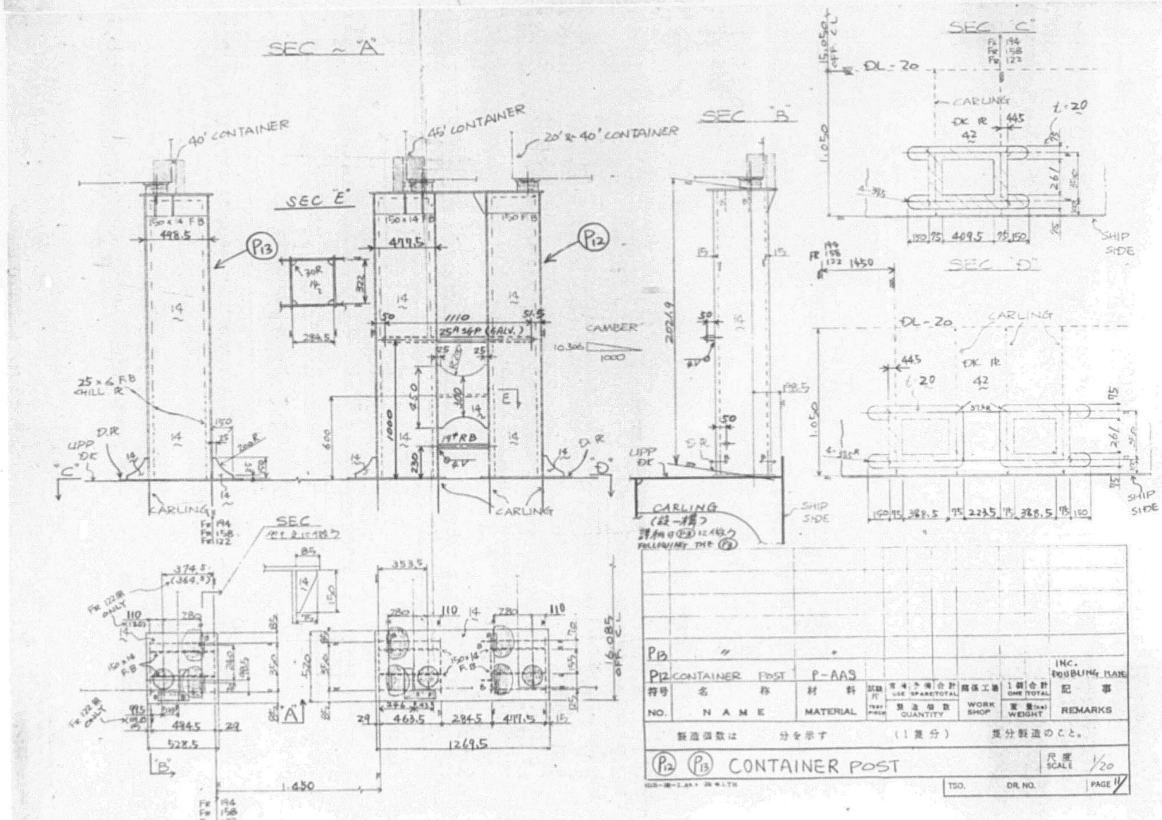
712


SEC ~ "A"
40' CONTAINER
45' CONTAINER
20' & 40' CONTAINER
SEC "E"
SEC "B"
SEC "C"
SEC "D"
CAMBER
CARLING
SHIP SIDE
UPP DK
FOLLOWING THE P8
P7
P6 CONTAINER POST P-AAS INC. DOUBLING PLATE
符号 NO. 名称 NAME 材料 MATERIAL QUANTITY WORK SHOP WEIGHT 記事 REMARKS
製造個数は 分を示す (1隻分) 隻分製造のこと。
P6 P7 CONTAINER POST
尺度 SCALE 1/20
TSO. DR. NO. PAGE 8/

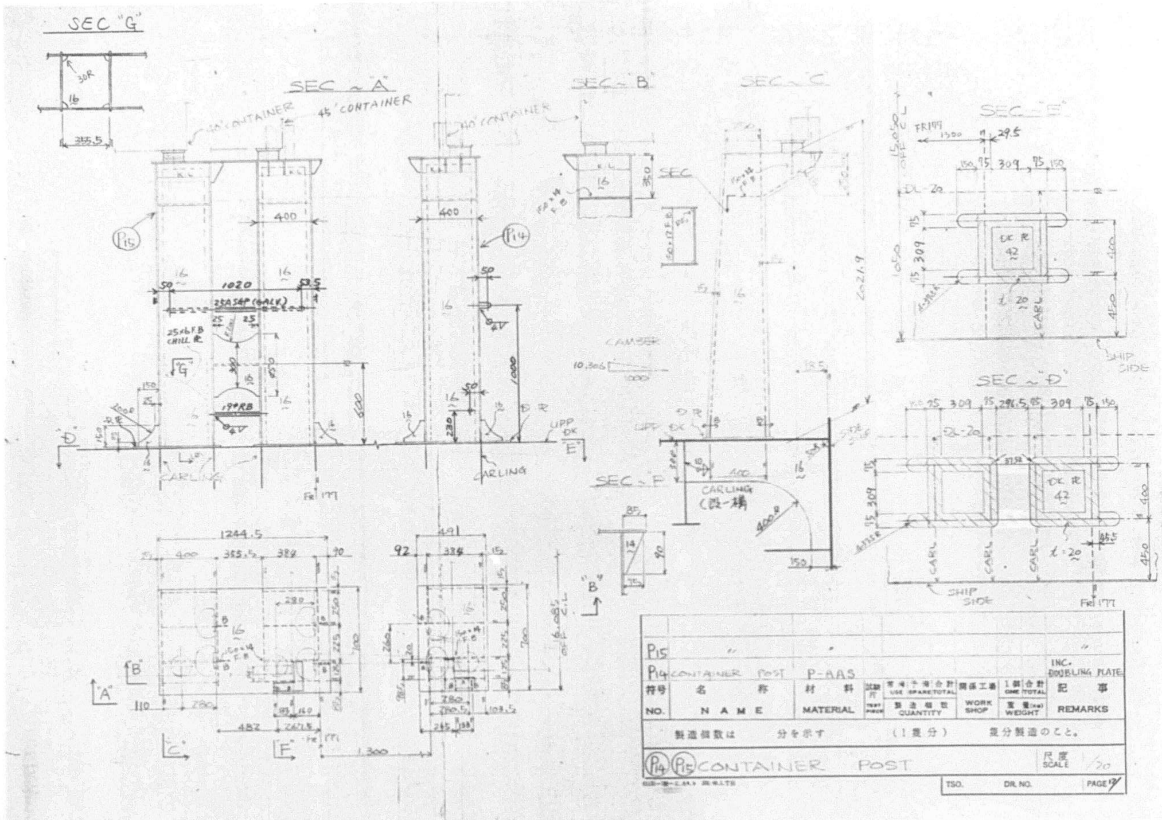

SEC ~ "A"
40' CONTAINER
45' CONTAINER
SEC "F"
SEC "B"
SEC "C"
SEC "D"
SEC "E"
CAMBER
CARLING
SHIP SIDE
FOLLOWING THE P8
P9
P8 CONTAINER POST P-AAS INC. DOUBLING PLATE
符号 NO. 名称 NAME 材料 MATERIAL QUANTITY WORK SHOP WEIGHT 記事 REMARKS
製造個数は 分を示す (1隻分) 隻分製造のこと。
P8 P9 CONTAINER POST
尺度 SCALE 1/20
TSO. DR. NO. PAGE 9/

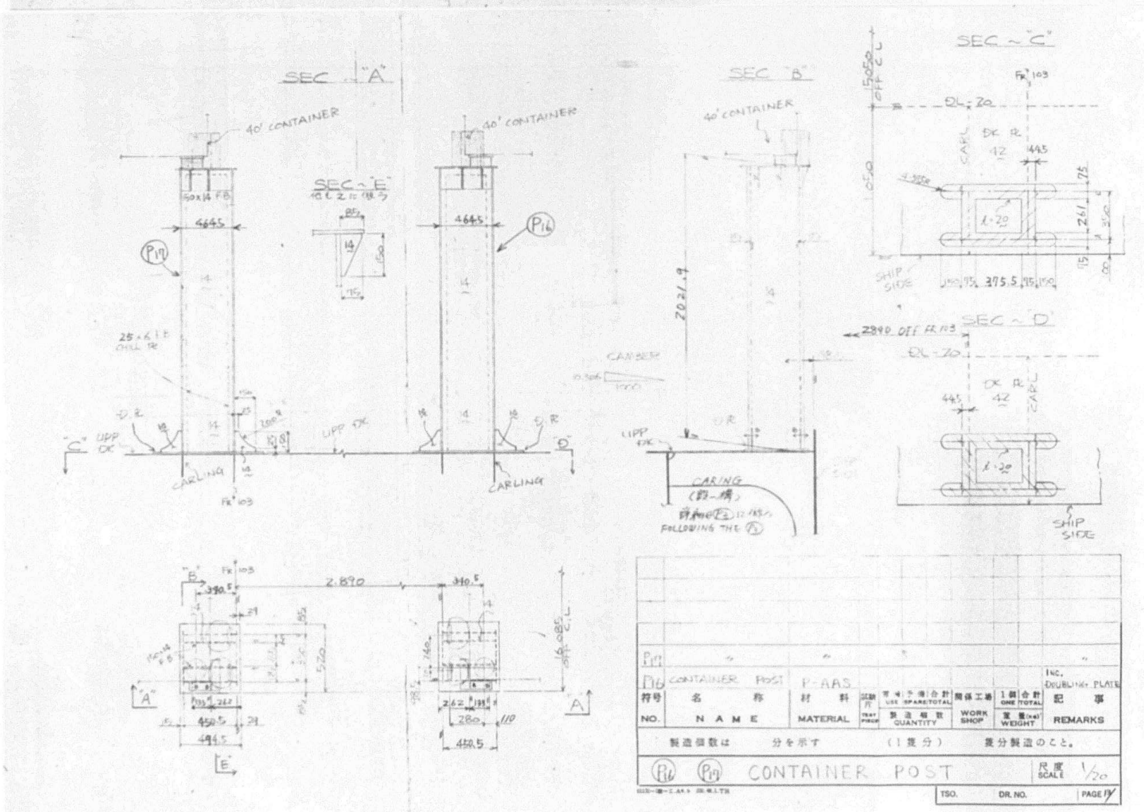
713


SEC ~ "A"
SEC ~ "B"
SEC ~ "C"
SEC ~ "D"
20' CONTAINER
CAMBER
CARLING
UPP DK
SHIP SIDE
P11 | " | " | | | | | "
P10 | CONTAINER POST | P-AAS | | | | | INC. DOUBLING PLATE
符号 NO. | 名称 NAME | 材料 MATERIAL | 試験片 TEST PIECE | 常備/予備/合計 USE/SPARE/TOTAL 製造個数 QUANTITY | 関係工場 WORK SHOP | 1個/合計 ONE/TOTAL 重量(kg) WEIGHT | 記事 REMARKS
製造個数は 分を示す (1隻分) 隻分製造のこと。
P10 P11 CONTAINER POST
尺度 SCALE 1/20
TSO. DR. NO. PAGE 14

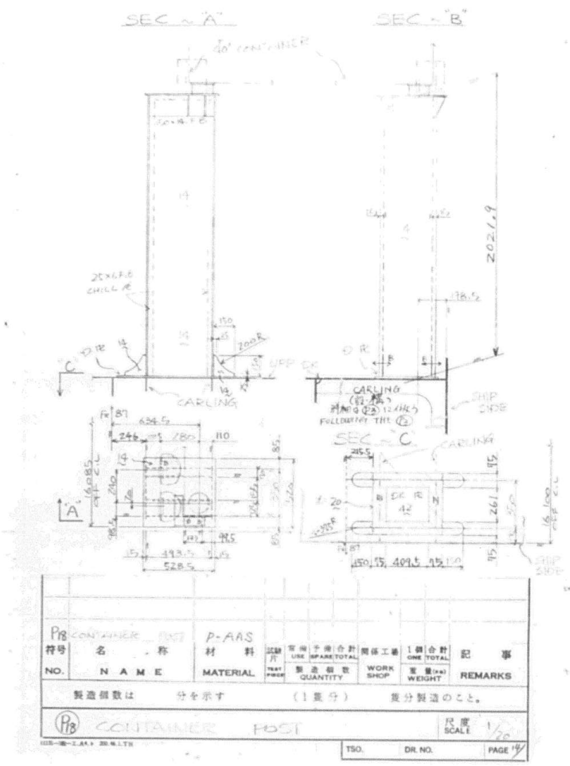

SEC ~ "A"
SEC "B"
SEC "C"
SEC "D"
SEC "E"
40' CONTAINER
45' CONTAINER
20' & 40' CONTAINER
CAMBER
CARLING
UPP DK
SHIP SIDE
P13 | " | " | | | | |
P12 | CONTAINER POST | P-AAS | | | | | INC. DOUBLING PLATE
符号 NO. | 名称 NAME | 材料 MATERIAL | 試験片 TEST PIECE | 常備/予備/合計 USE/SPARE/TOTAL 製造個数 QUANTITY | 関係工場 WORK SHOP | 1個/合計 ONE/TOTAL 重量(kg) WEIGHT | 記事 REMARKS
製造個数は 分を示す (1隻分) 隻分製造のこと。
P12 P13 CONTAINER POST
尺度 SCALE 1/20
TSO. DR. NO. PAGE 17

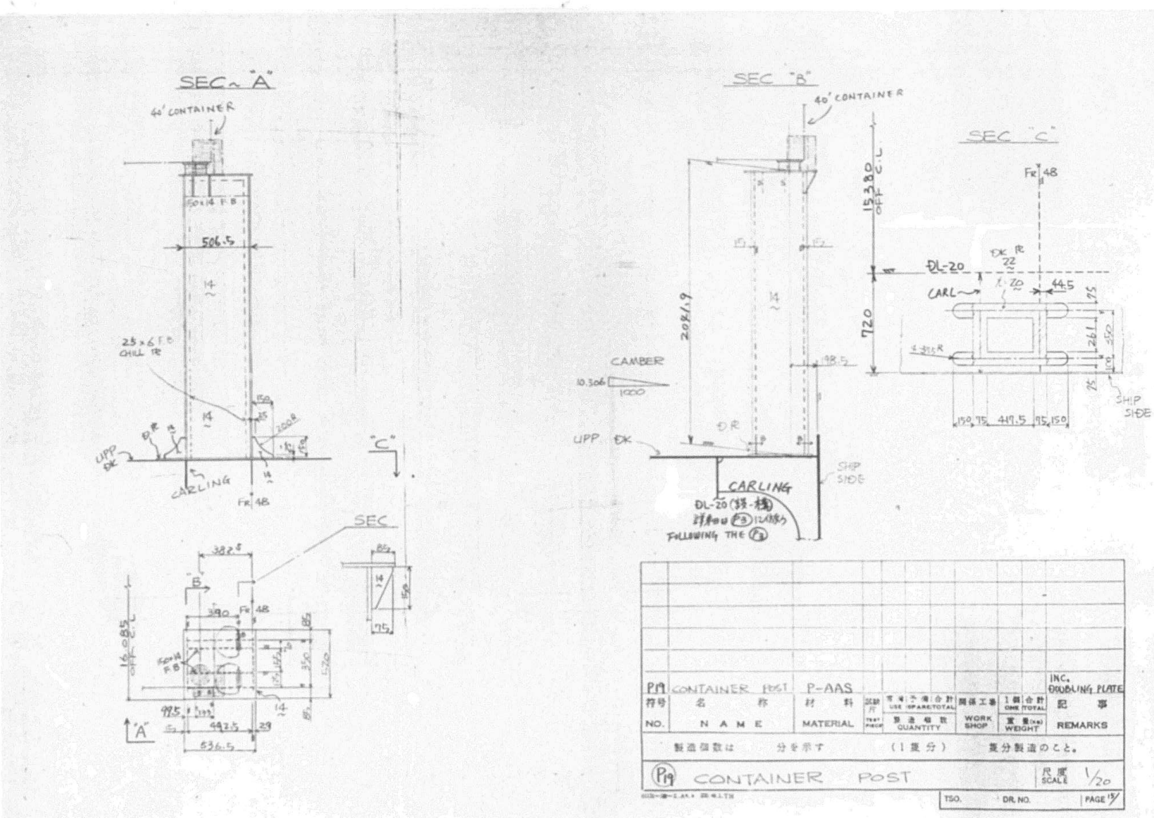
714


SEC "G"
SEC ~ "A"
SEC ~ "B"
SEC ~ "C"
SEC ~ "E"
SEC ~ "D"
SEC ~ "F"
40' CONTAINER
45' CONTAINER
CARLING
UPP DK
SHIP SIDE
CAMBER
P14
P15
CONTAINER POST
P-AAS
INC. DOUBLING PLATE
NAME
MATERIAL
QUANTITY
WORK SHOP
WEIGHT
REMARKS
製造個数は 分を示す (1隻分) 隻分製造のこと。
P14 P15 CONTAINER POST
SCALE 1/20
TSO.
DR. NO.
PAGE

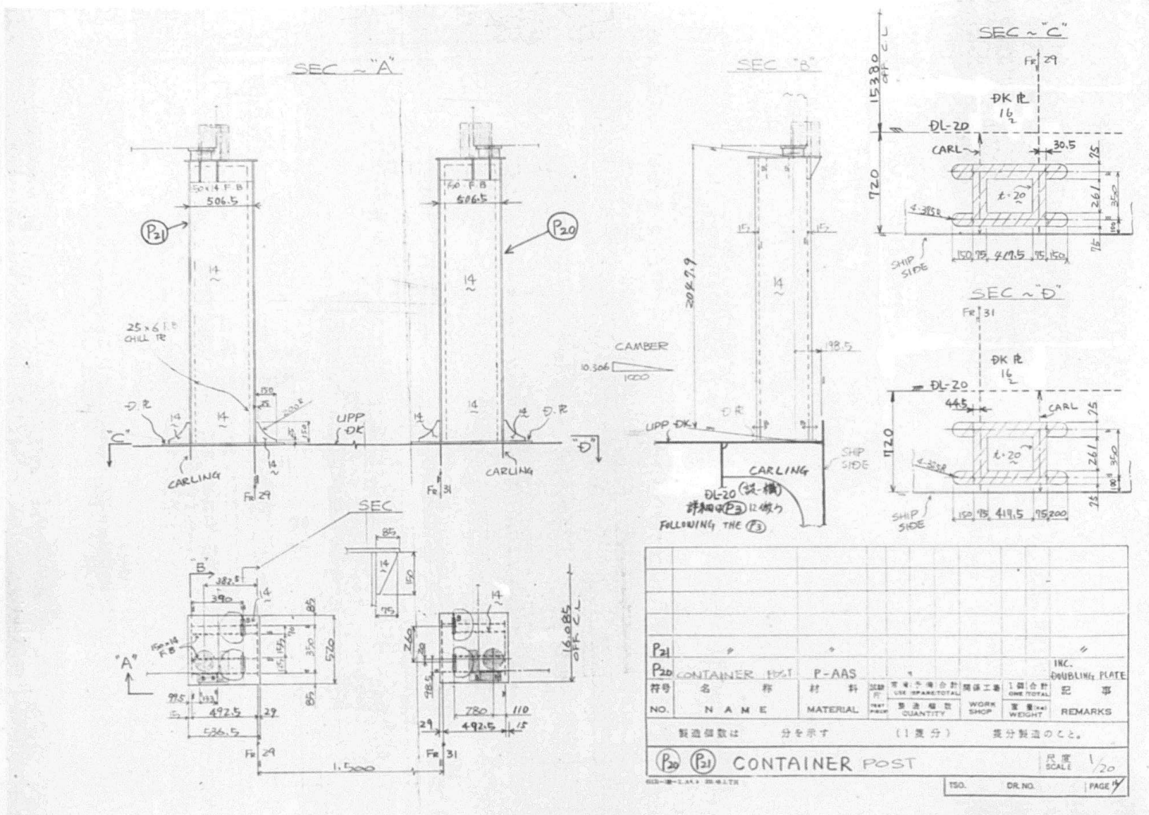

SEC "A"
SEC "B"
SEC ~ "C"
SEC ~ "D"
SEC ~ "E"
40' CONTAINER
CARLING
UPP DK
SHIP SIDE
CAMBER
FOLLOWING THE
P16
P17
CONTAINER POST
P-AAS
INC. DOUBLING PLATE
NAME
MATERIAL
QUANTITY
WORK SHOP
WEIGHT
REMARKS
製造個数は 分を示す (1隻分) 隻分製造のこと。
P16 P17 CONTAINER POST
SCALE 1/20
TSO.
DR. NO.
PAGE

715

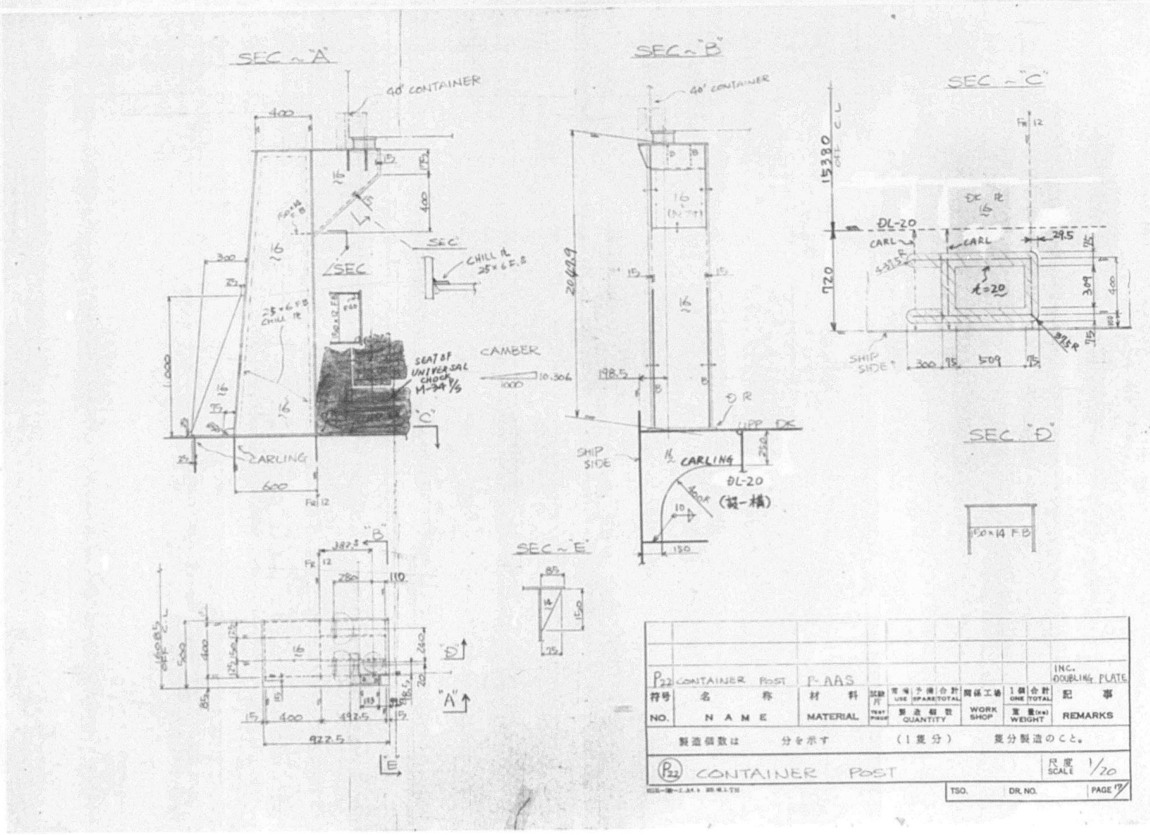

SEC ~ "A"
SEC ~ "B"
SEC ~ "C"
40' CONTAINER
CARLING
SHIP SIDE
UPP DK
P18 CONTAINER POST
P-AAS
NAME
MATERIAL
QUANTITY
WORK SHOP
WEIGHT
REMARKS
製造個数は 分を示す (1隻分) 隻分製造のこと。
CONTAINER POST
SCALE 1/20


SEC ~ "A"
SEC "B"
SEC "C"
40' CONTAINER
CARLING
SHIP SIDE
UPP DK
CAMBER
DL-20
FOLLOWING THE
P19 CONTAINER POST
P-AAS
INC. DOUBLING PLATE
NAME
MATERIAL
QUANTITY
WORK SHOP
WEIGHT
REMARKS
製造個数は 分を示す (1隻分) 隻分製造のこと。
CONTAINER POST
SCALE 1/20

716

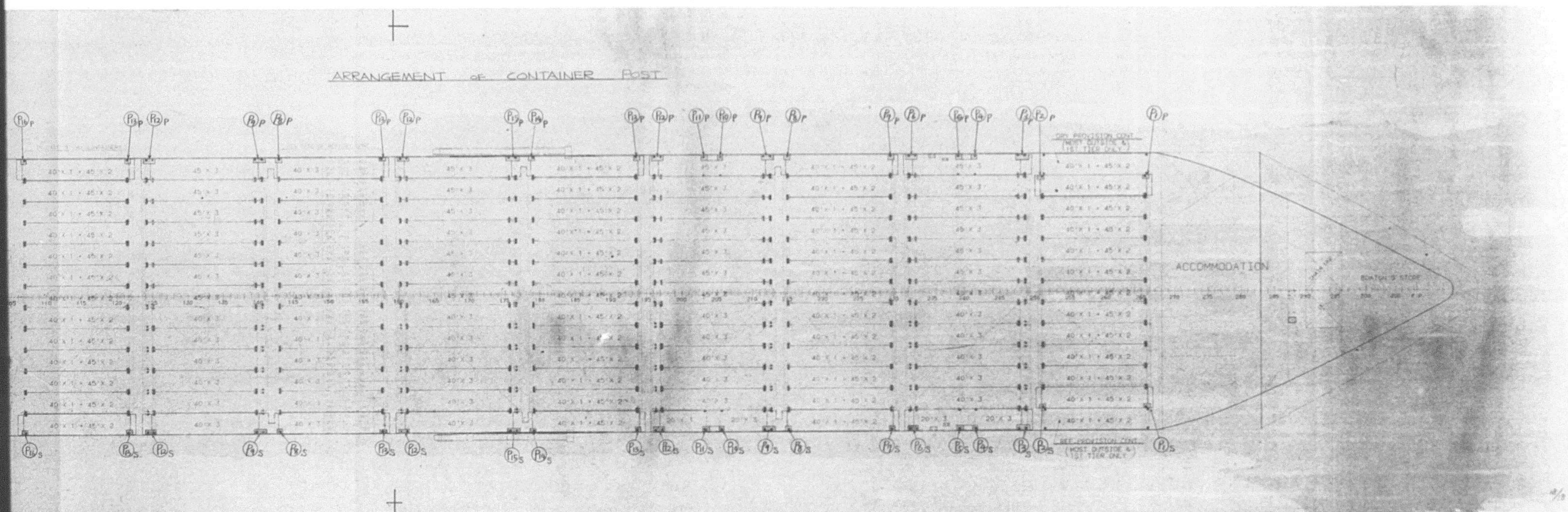


SEC ~ "A"
SEC "B"
SEC ~ "C"
SEC ~ "D"
SEC
CAMBER
CARLING
UPP DK
SHIP SIDE
DK PL
DL-20
CARL
FOLLOWING THE P3
P21
P20 CONTAINER POST P-AAS INC. DOUBLING PLATE
NO. NAME MATERIAL QUANTITY WORK SHOP WEIGHT REMARKS
P20 P21 CONTAINER POST
SCALE 1/20

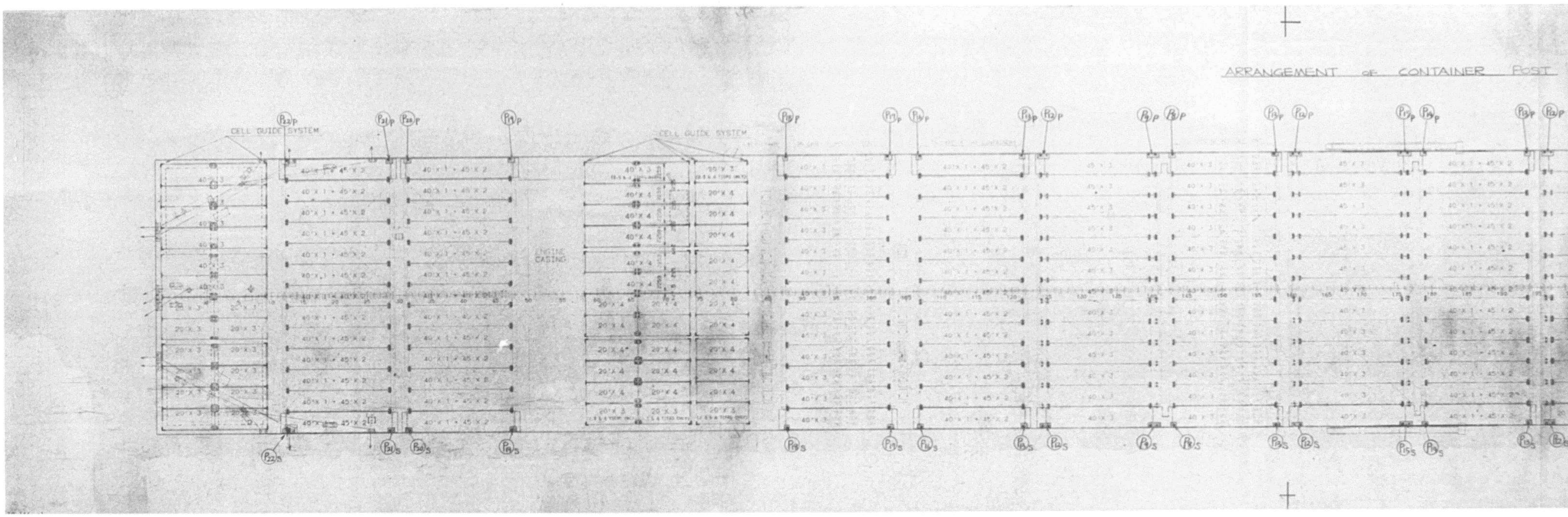


SEC ~ "A"
SEC ~ "B"
SEC ~ "C"
SEC "D"
SEC ~ "E"
40' CONTAINER
SEAT OF UNIVERSAL CHOCK
CAMBER
CARLING
UPP DK
SHIP SIDE
DL-20
CHILL PL
P22 CONTAINER POST P-AAS INC. DOUBLING PLATE
NO. NAME MATERIAL QUANTITY WORK SHOP WEIGHT REMARKS
P22 CONTAINER POST
SCALE 1/20

717



718


ARRANGEMENT OF CONTAINER POST
CELL GUIDE SYSTEM
CELL GUIDE SYSTEM
ENGINE CASING

APPROVAL OF OWNER & REGULATORY BODIES								
ALT. NO.	OWNER		USCG		ABS		USPH	
	DATE	LETTER NO.	DATE	LETTER NO.	DATE	LETTER NO.	DATE	LETTER NO.
ORIGINAL	21 JUNE '86	0735/MES-609			4 JULY '86	77/84 7-P-3		

FINISHEDPLAN

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SHIPYARD AND SHIP'S NO. & NAME			
MITSUI TAMANO		MITSUBISHI KOBE	
NO.1323	DOCTOR LYKES	NO.1158	JAMES LYKES
NO.1324	ALMERIA LYKES	NO.1159	JOSEPH LYKES
NO.1325	TILLIE LYKES	NO.1164	SOLON TURMAN

MITSUI ENGINEERING & SHIPBUILDING CO., LTD.
TAMANO WORKS

SHIP DESIGN DEPARTMENT — SHIP'S NO. **NO.1325** — SHIP'S NAME **TILLIE LYKES**

OUTFITTING DESIGN SECTION

レイズドベルマウスボックス
RAISED BELLMOUTH BOX (ANCHOR)

DATE (TEL 3230)
JOB NO. TS1323/24/25 — SCALE 1/50 — LYKES REF. NO. 120510 — MITSUI DRAWING NO. 4102202
8-03-02
(6 SHEETS WITH COVER)

1/6

PLAN RECORD			
ALT. NO.	MARK	ALTERATION/DESCRIPTION	DATE & SIGNATURE
1		PREPARED FOR S.NO.1323 AS FINISHED PLAN, MADE APPLICABLE TO S.NO.1324 AND S.NO.1325.	NOVEMBER 20 '86

DWG. NO. 4102202 — 2/6

NOTES:-

1. BOTH SIDES TO BE SYMMETRICAL EXCEPT SPECIFIED.
2. TRANS. SECTIONS TO BE "LOOKING FORE" EXCEPT SPECIFIED.
3. REFER TO "CONSTRUCTION DETAILS (DWG NO. 2100811)" FOR STRUCTURAL DETAILS OF MEMBERS, ETC. EXCEPT SPECIFIED.
4. REFER TO "WELDING TABLE (DWG NO. 2100832)" FOR LEG LENGTH OF WELDING EXCEPT SPECIFIED.
5. REFER TO "HAWSE PIPE AND CHAIN PIPE (DWG. NO.4102201)".

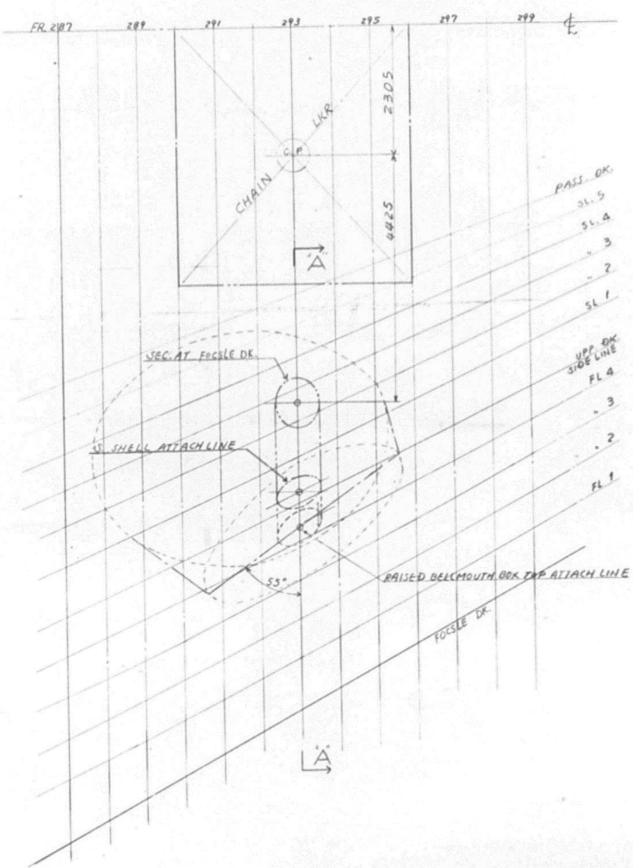
備考:-

1. 特記の他は，両舷対称とする。
2. 横断面図は，特記の他は後面を示す。
3. 構造詳細については，特記の他は"構造詳細図（図番2100811）"を参照のこと。
4. 脚長については，特記の他は"溶接脚長表（図番2100832）"を参照のこと。
5. 別図"ホースパイプ及びチェーンパイプ"(DWG. NO. 4102201)を参照のこと。

DWG. NO. 4102202 3/6

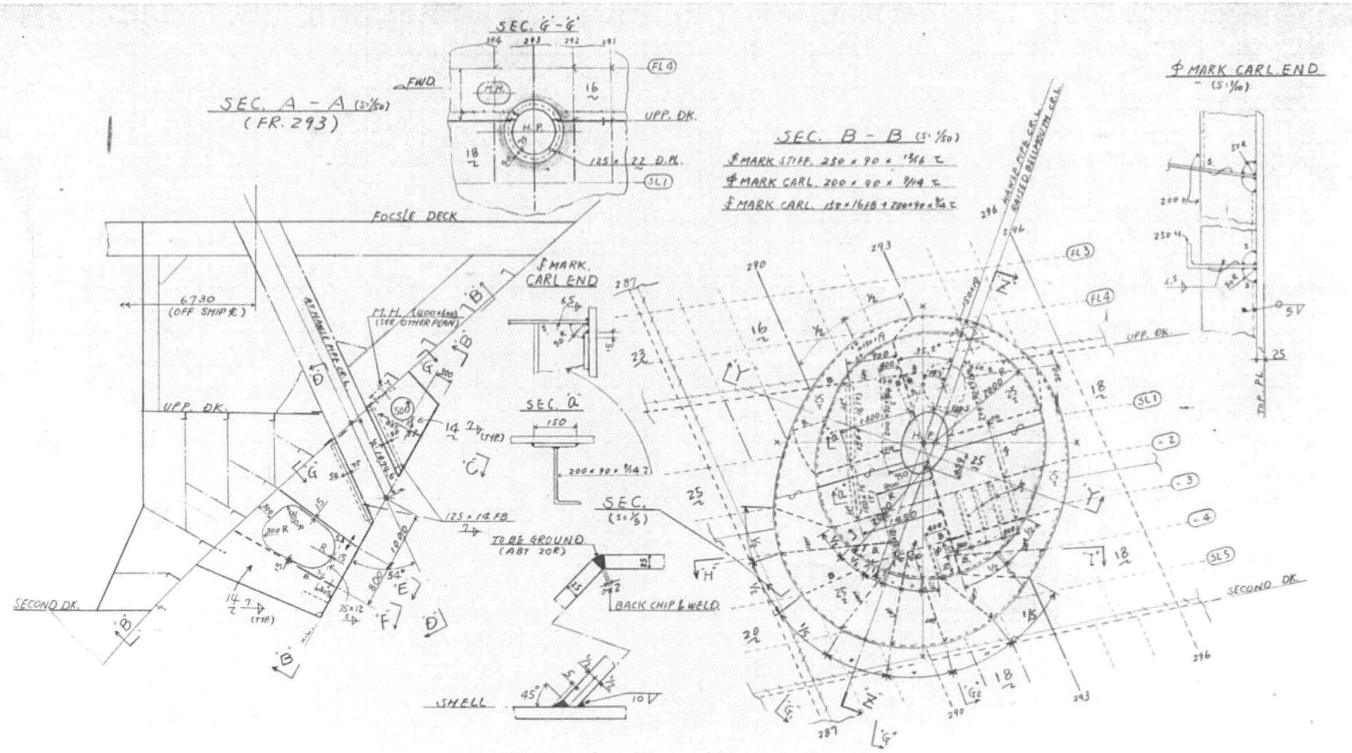
720

SIDE LONG'L PLAN
(DOWNWARD VIEW) (S. SIDE)



DWG. NO. 4102202 4/6

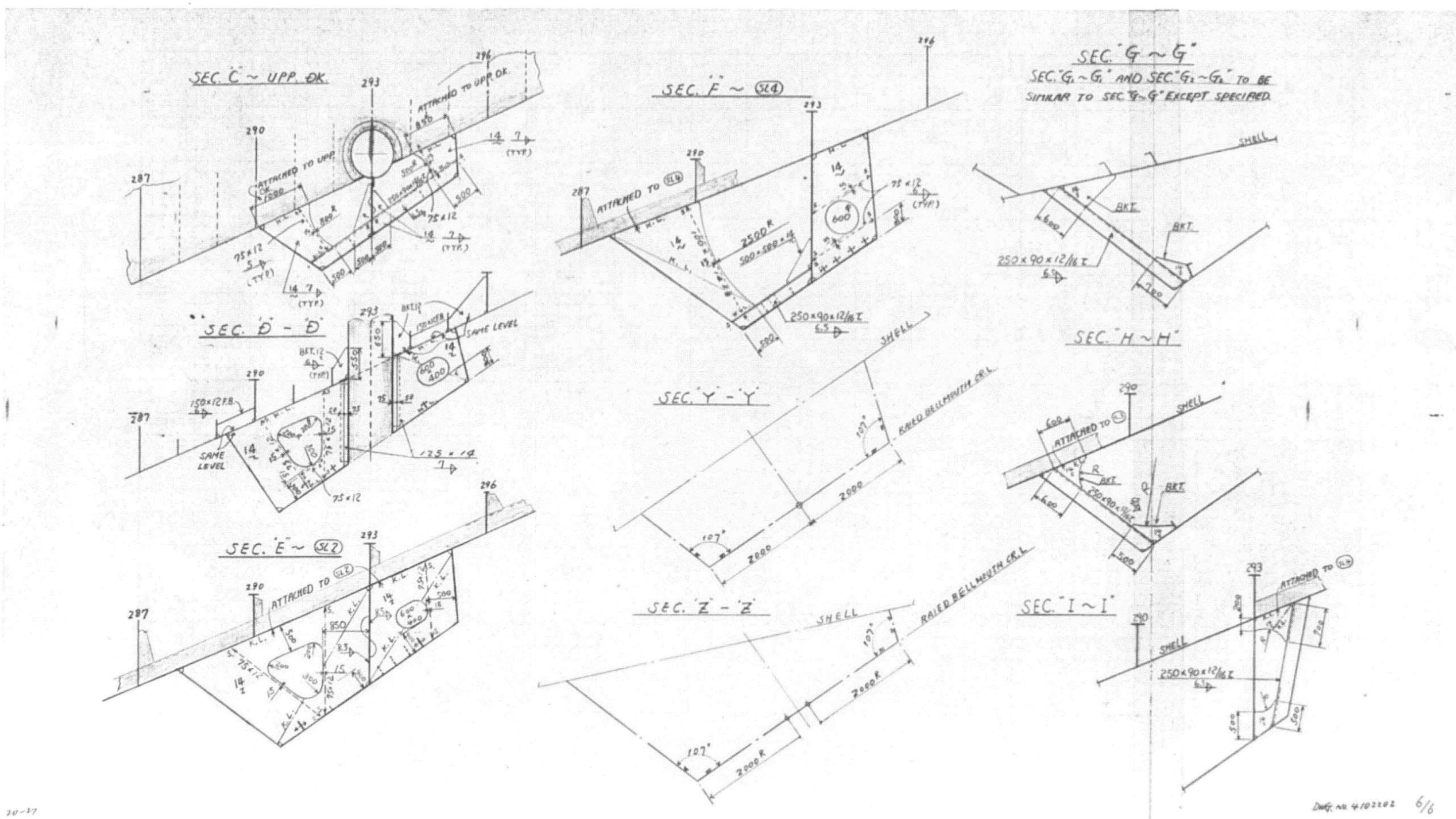
721



DWG. No. 4102202

5/6

722



SEC. "C" ~ UPP. DK
SEC. "F" ~ SL4
SEC. "G ~ G"
SEC. "G1 ~ G1" AND SEC. "G2 ~ G2" TO BE SIMILAR TO SEC. "G ~ G" EXCEPT SPECIFIED.
SEC. "D - D"
SEC. "Y - Y"
SEC. "H ~ H"
SEC. "E" ~ SL2
SEC. "Z - Z"
SEC. "I ~ I"
SHELL
RAISED BELLMOUTH CR.L.
250×90×12/16 I
DWG. NO. 4102202 6/6

APPROVAL OF OWNER & REGULATORY BODIES

ALT.NO.	OWNER		USCG		ABS		USPH	
	DATE	LETTER NO.	DATE	LETTER NO.	DATE	LETTER NO.	DATE	LETTER NO.
ORIGINAL	17 JUL '86	OFPS/MES-786			20 AUG '86	T-8-2		
1ST PART REV	2 NOV '86	TAM/131			19 DEC '86	T-8-2		
2ND PART REV	6 FEB '86	TAM/147			20 FEB '86	T-8-2		

FINISHEDPLAN

SHIPYARD AND SHIP'S NO. & NAME			
MITSUI TAMANO		MITSUBISHI KOBE	
NO.1323	DOCTOR LYKES	NO.1158	JAMES LYKES
NO.1324	ALMERIA LYKES	NO.1159	JOSEPH LYKES
NO.1325	TILLIE LYKES	NO.1164	SOLON TURMAN

MITSUI ENGINEERING & SHIPBUILDING CO.,LTD.
TAMANO WORKS

SHIP DESIGN DEPARTMENT — MANAGER: [signature] — STRUCTURE DESIGN SEC.

SHIP'S NO.: 1325 — SHIP'S NAME: TILLIE LYKES

コンテナー支持構造（支持台）
CONT. SUPPORT CONST. (PEDESTAL)

STAFF: M. Ogawa (TEL 22301)

JOB NO.: TS1323/24/25 — JOBCLASSIF. NO.: 8.07 — SCALE: 1/100 — LYKES REF. NO.: 120511 — MITSUI DRAWING NO.: 2107317

(20 SHEETS WITH COVER)

PLAN RECORD

ALT.NO.	MARK	ALTERATION/DESCRIPTION	DATE & SIGNATURE
		"PREPARED FOR S.NO.1323 AS FINISHED PLAN, MADE APPLICABLE TO S.NO.1324 AND S.NO.1325."	NOV.28.'86
		FOR APL MODIFICATIONS, THIS DRAWING WAS MODIFIED PARTLY AND THESE WERE SHOWN ON "MODIFICATION PLAN OF NO.1 HOLD(AFT) CONT. SUPP (40'/45'→40')" CHES DWG No 2107321M PAGE 7~P. 12~13)	

DWG.NO. 2107317-1/

NOTES:-

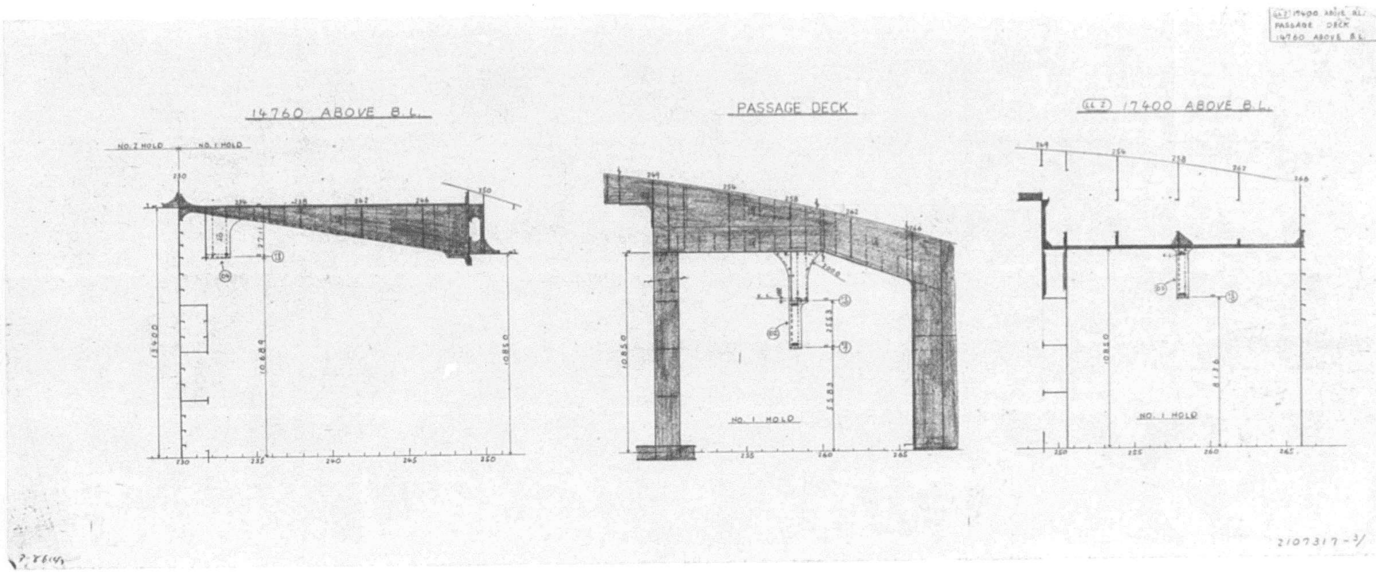
1. BOTH SIDES TO BE SYMMETRICAL EXCEPT SPECIFIED.
2. TRANS. SECTIONS TO BE "LOOKING FORE" EXCEPT SPECIFIED.
3. REFER TO "CONSTRUCTION DETAILS (DWG NO. 2100811)" FOR STRUCTURAL DETAILS OF MEMBERS, ETC. EXCEPT SPECIFIED.
4. REFER TO "WELDING TABLE (DWG NO. 2100832)" FOR LEG LENGTH OF WELDING EXCEPT SPECIFIED.

備考:-

1. 特記の他は，両舷対称とする。
2. 横断面図は，特記の他は後面を示す。
3. 構造詳細については，特記の他は「構造詳細図（図番2100811）」を参照のこと。
4. 溶接脚長については，特記の他は「溶接脚長表（図番2100832）」を参照のこと。

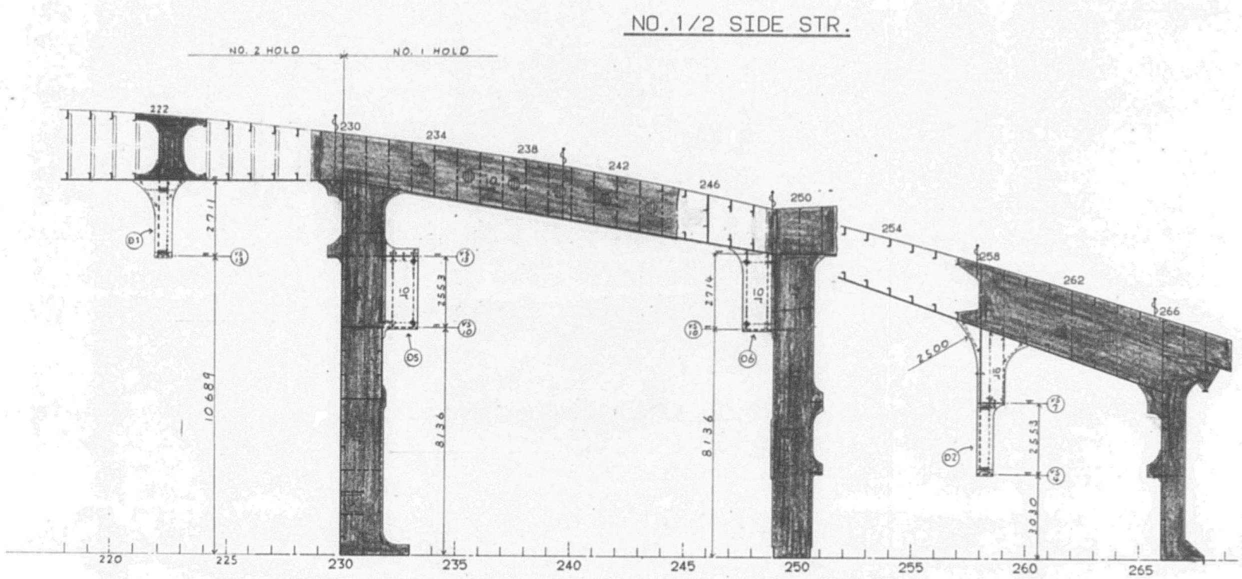
2107317-2/

724


17400 ABOVE B.L.
PASSAGE DECK
14760 ABOVE B.L.
14760 ABOVE B.L.
PASSAGE DECK
17400 ABOVE B.L.
NO. 1 HOLD
NO. 1 HOLD
2107317-3/

725

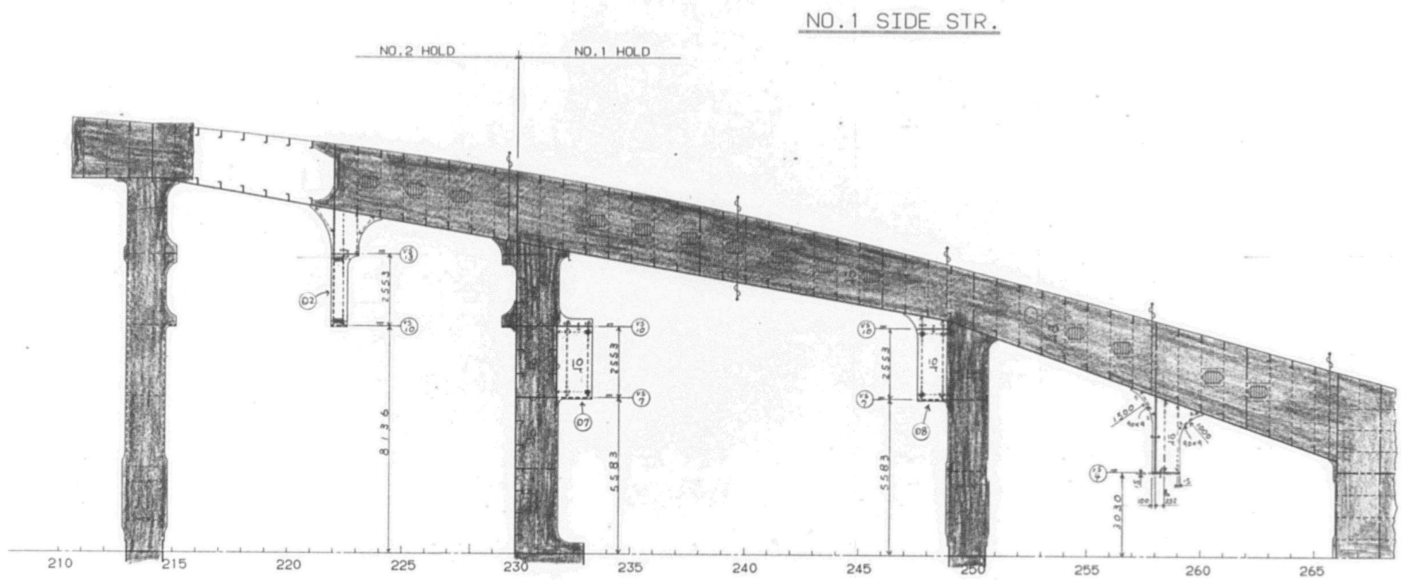
NO.1/2 S.STR.



2107317-4/

726

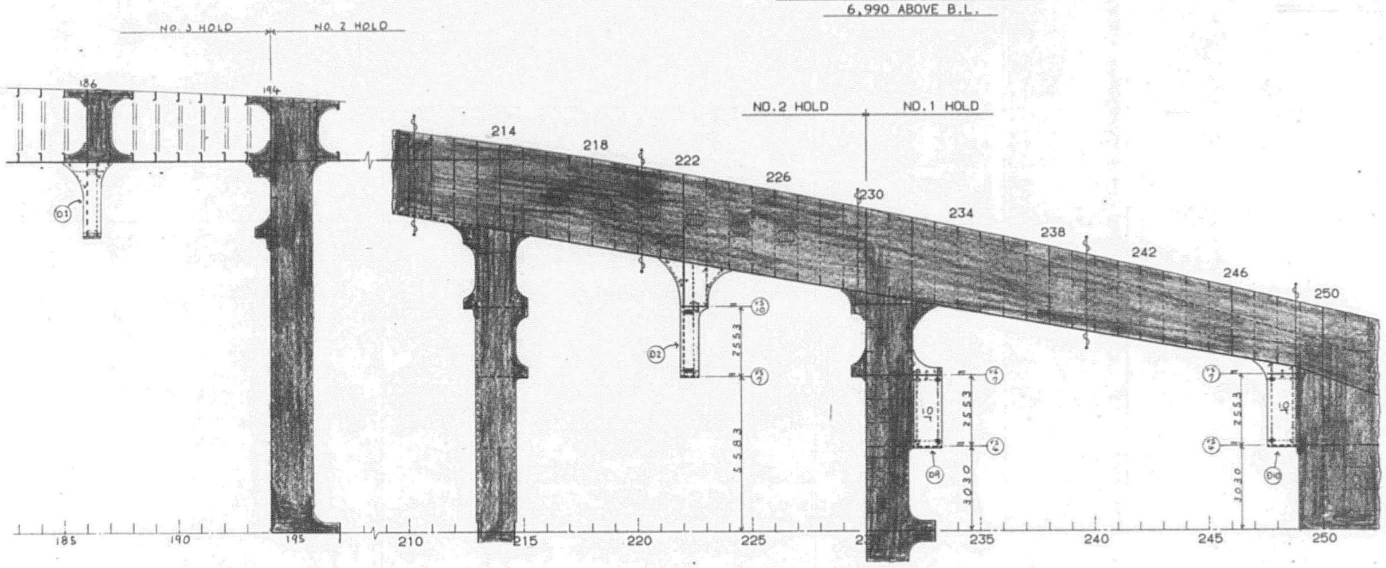
NO.1 S.STR.



2107317-5/

727

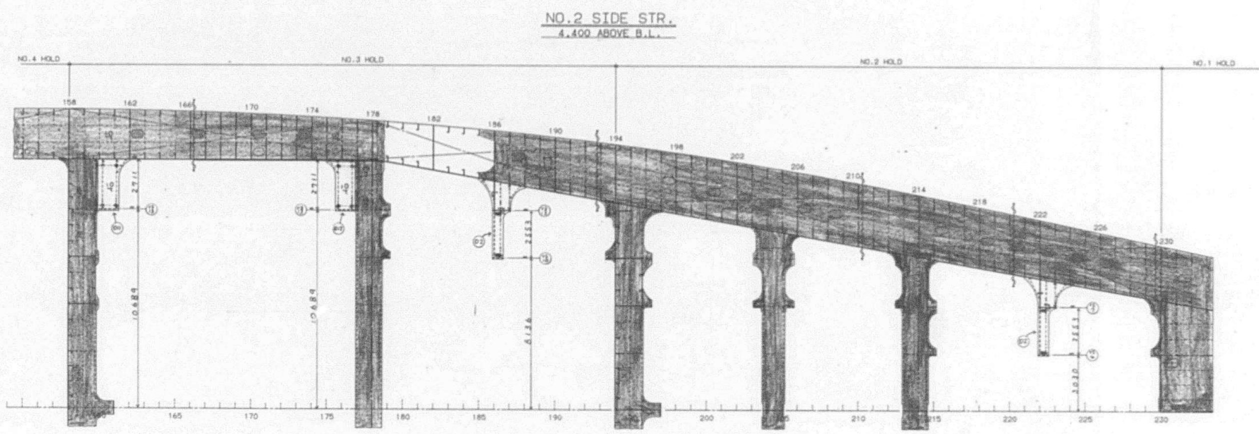
NO.1 1/2 S.STR.



2107317-61

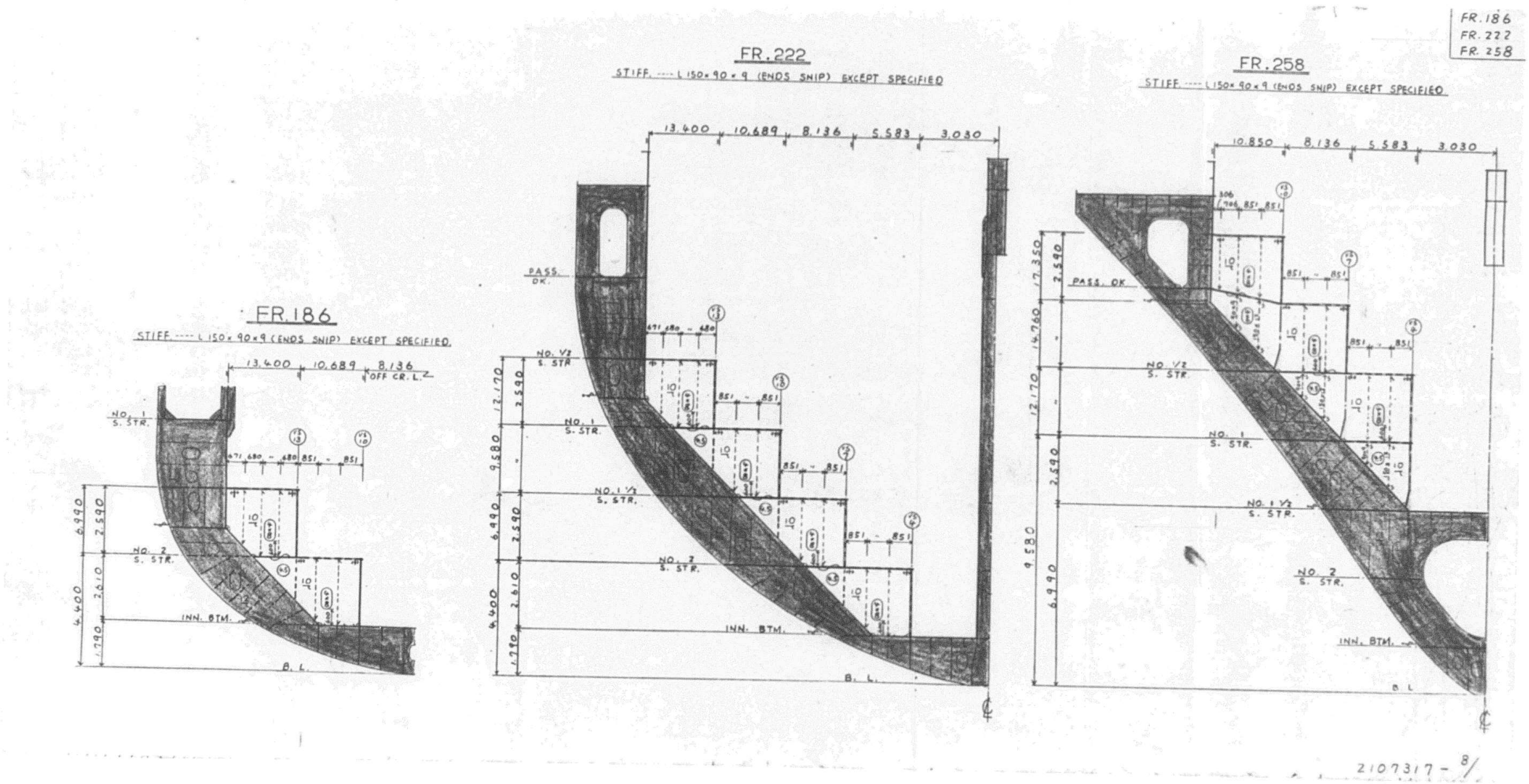
728

NO.2 S.STR.



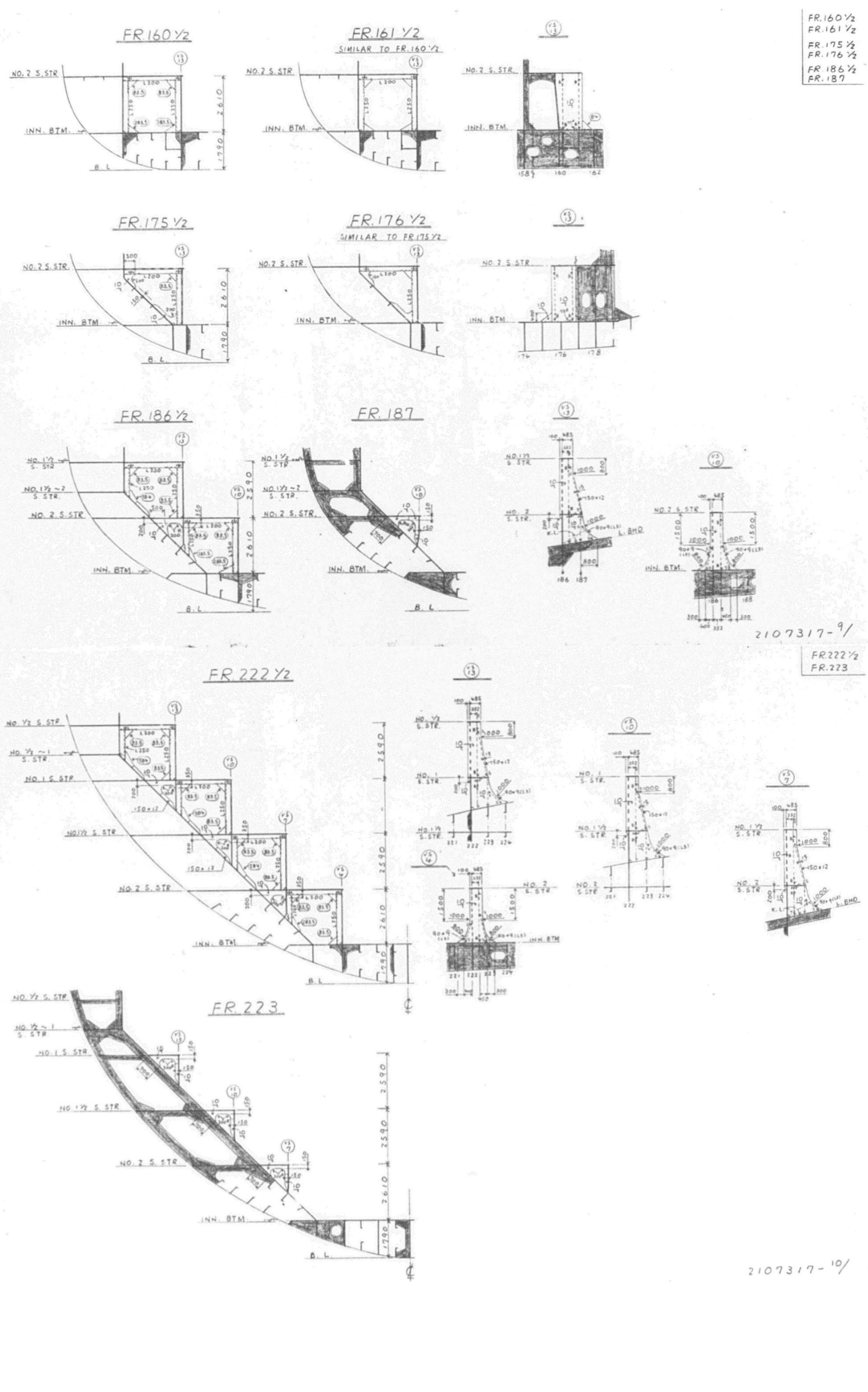
21073-7-71

729



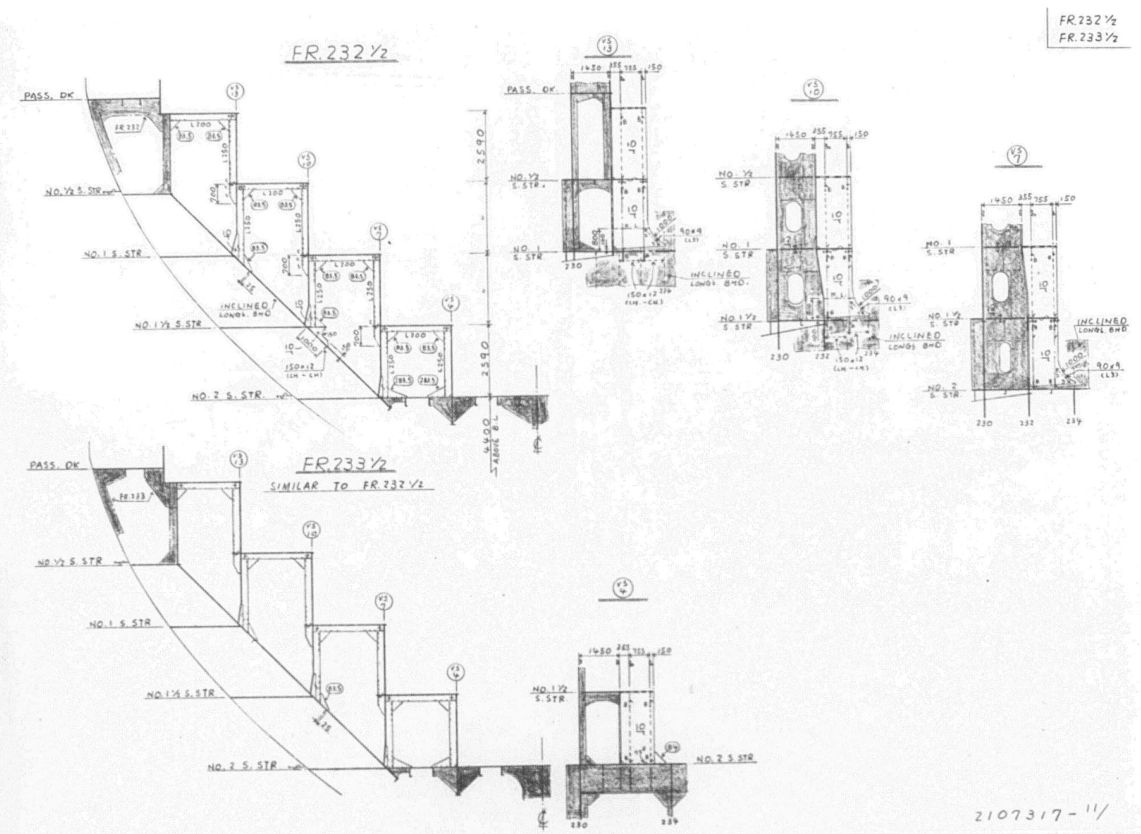
FR.186
FR.222
FR.258
FR.186
STIFF. ---- L150×90×9 (ENDS SNIP) EXCEPT SPECIFIED
FR.222
STIFF. ---- L150×90×9 (ENDS SNIP) EXCEPT SPECIFIED
FR.258
STIFF. ---- L150×90×9 (ENDS SNIP) EXCEPT SPECIFIED
PASS. DK.
NO. 1/2 S. STR.
NO. 1 S. STR.
NO. 1 1/2 S. STR.
NO. 2 S. STR.
INN. BTM.
B. L.
2107317-8/

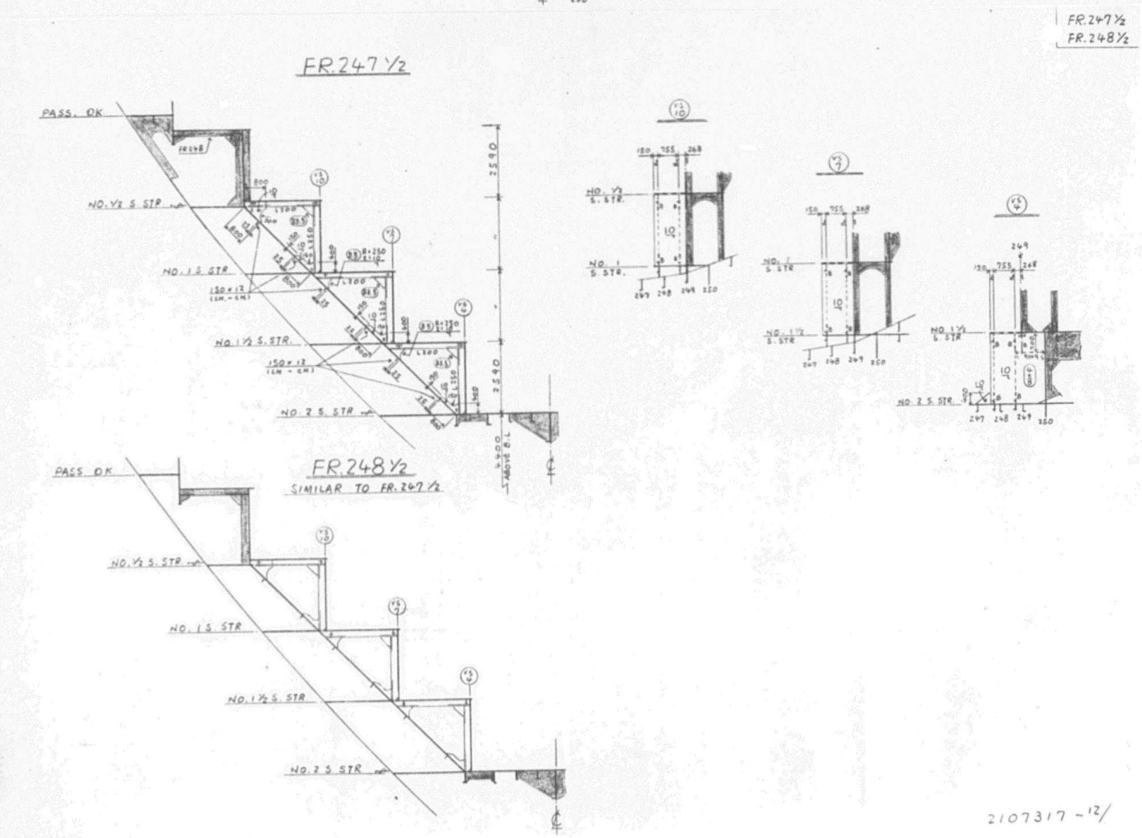
730

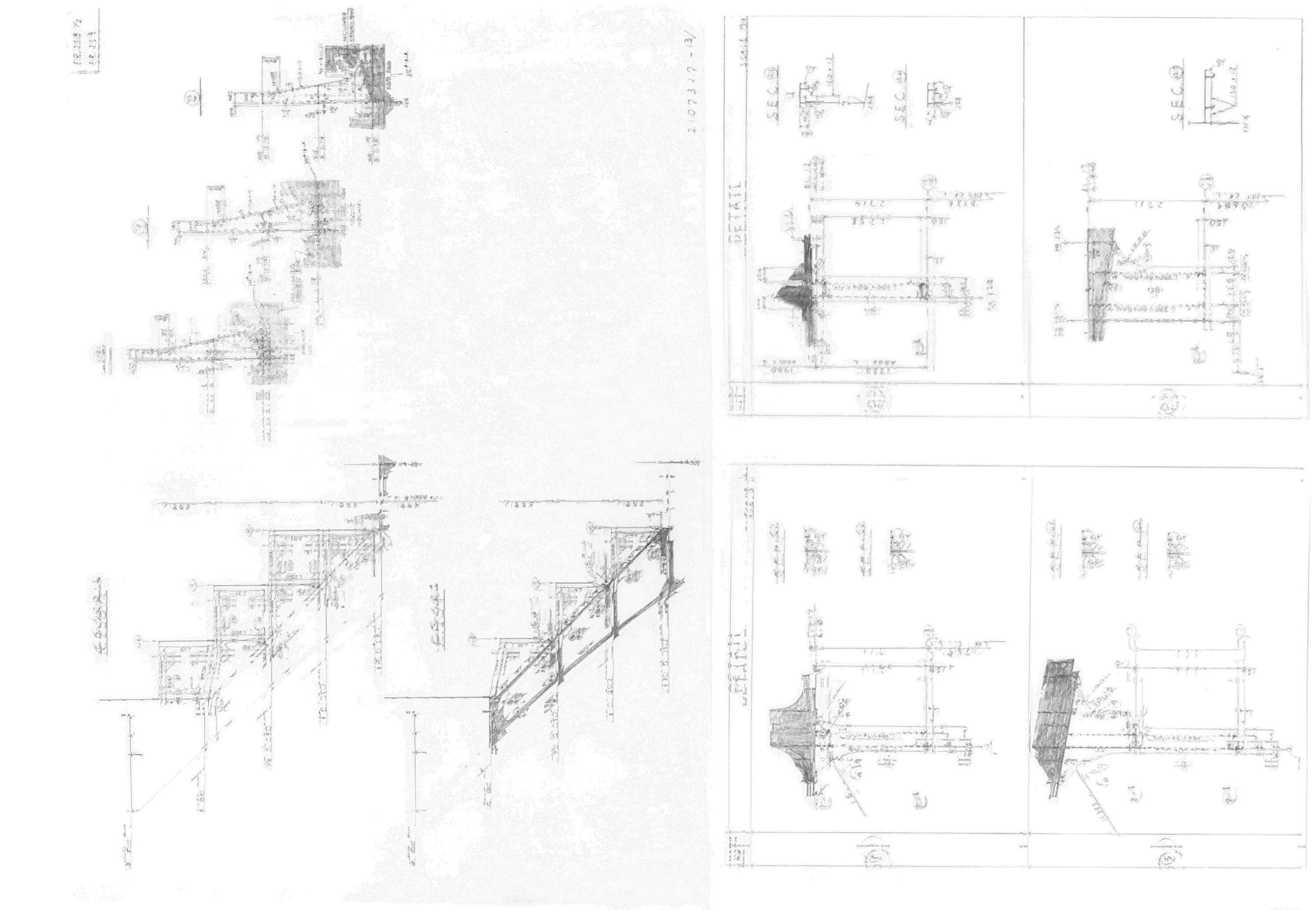


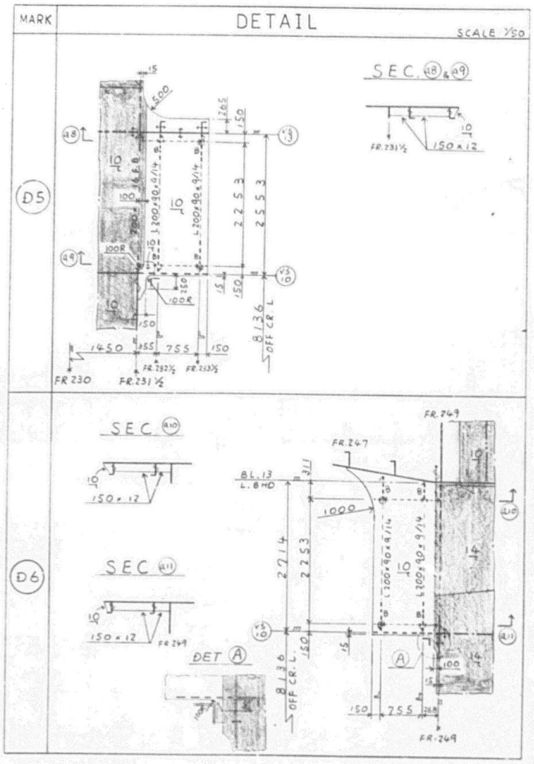
FR.160 ½
FR.161 ½
SIMILAR TO FR.160 ½
FR.175 ½
FR.176 ½
SIMILAR TO FR.175 ½
FR.186 ½
FR.187
FR.222 ½
FR.223
NO.2 S.STR.
INN. BTM.
B.L.
2610
1790
2590
FR.160 ½
FR.161 ½
FR.175 ½
FR.176 ½
FR.186 ½
FR.187
2107317-9/
FR.222 ½
FR.223
2107317-10/

731

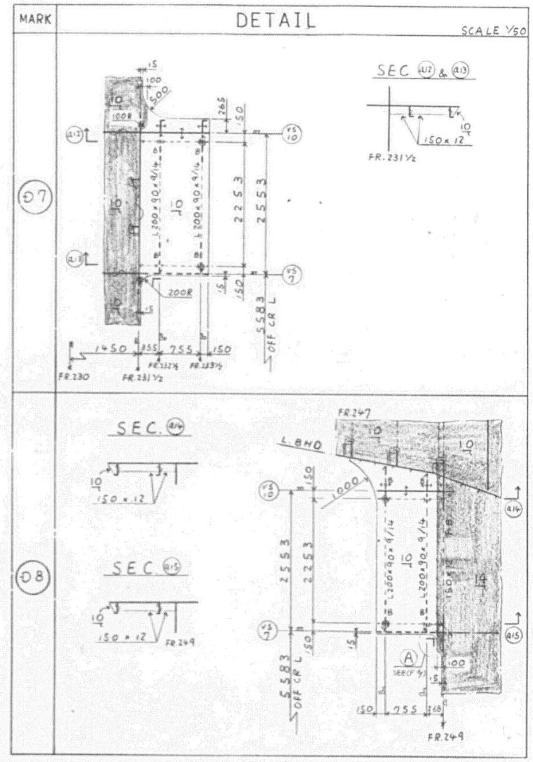

FR.232 ½
FR.233 ½
FR.232 ½
PASS. DK
NO. ½ S. STR
NO. 1 S. STR
NO. 1½ S. STR
NO. 2 S. STR
INCLINED LONGL BHD
2590
4400 ABOVE B.L.
FR.233 ½
SIMILAR TO FR.232 ½
2107317-11/


FR.247 ½
FR.248 ½
FR.247 ½
PASS. DK
NO. ½ S. STR
NO. 1 S. STR
NO. 1½ S. STR
NO. 2 S. STR
2590
4400 ABOVE B.L.
FR.248 ½
SIMILAR TO FR.247 ½
2107317-12/

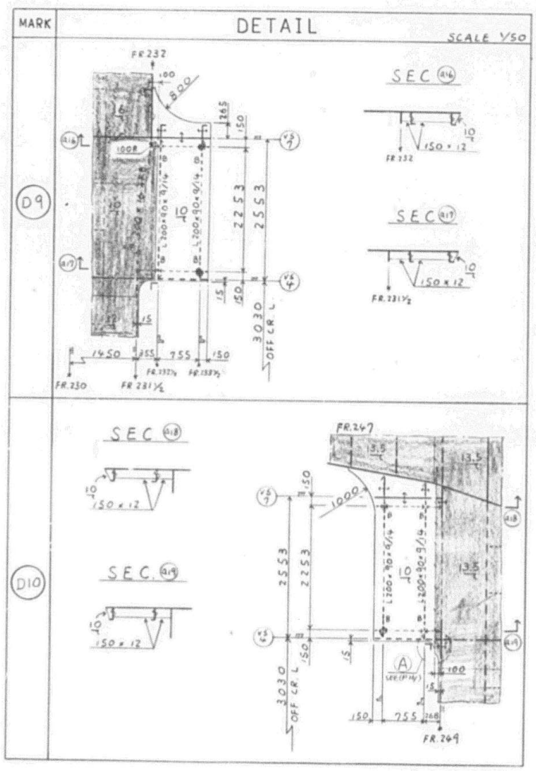




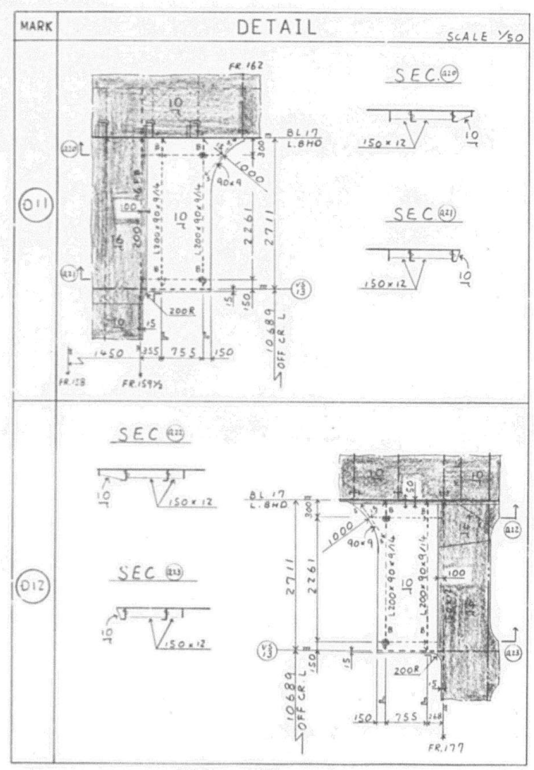
2107317-16/



2107317-17/



2107317-18/



2107317-19/19

734

ALT. NO.	OWNER DATE	OWNER LETTER NO.	USCG DATE	USCG LETTER NO.	ABS DATE	ABS LETTER NO.	USPH DATE	USPH LETTER NO.
ORIGINAL	6 FEB '87	–			11 FEB '87	T-8-2		

APPROVAL OF OWNER & REGULATORY BODIES

FINISHEDPLAN

SHIPYARD AND SHIP'S NO. & NAME			
MITSUI TAMANO		MITSUBISHI KOBE	
NO.1323	DOCTOR LYKES	NO.1158	JAMES LYKES
NO.1324	ALMERIA LYKES	~~NO.1159~~	~~JOSEPH LYKES~~
NO.1325	TILLIE LYKES	~~NO.1164~~	~~SOLON TURMAN~~

MITSUI ENGINEERING & SHIPBUILDING CO.,LTD.
TAMANO WORKS

SHIP DESIGN DEPARTMENT — SHIP'S NO. **1325** — SHIP'S NAME **TILLIE LYKES**

STRUCTURE DESIGN SEC.

APL MODIFICATION

コンテナ支柱構造改造図(第4倉後部)

MODIFICATION PLAN OF NO.4 HOLD (AFT)
CONT. SUPP. (20'×2 → 45')

SCALE 1/100 — LYKES REF. NO. **120512** — MITSUI DRAWING NO. **2107320M**

(11 SHEETS WITH COVER)

PLAN RECORD

ALT. NO.	MARK	ALTERATION/DESCRIPTION	DATE & SIGNATURE
		THIS DRAWING WAS PREPARED FOR THE APL MODIFICATION, AND CONCERNED LYKES DRAWINGS ARE AS FOLLOWS.	
		(DWG NAME) (MES DWG NO)	
		(1) CARGO HOLD CONSTRUCTION (NO 3 & 4 HOLD) 2101018	
		(2) CONT. SUPPORT CONST. (NO 3 & 4 H) 2107313	
		(3) HATCH COAMING 2101311	
		PREPARED FOR S.NO.1323 AS FINISHED PLAN. MADE APPLICABLE TO S.NO.1324 AND S.NO.1325	FEB 15 '87 Y. HATAISHI

DWG. NO. 2107320-1/

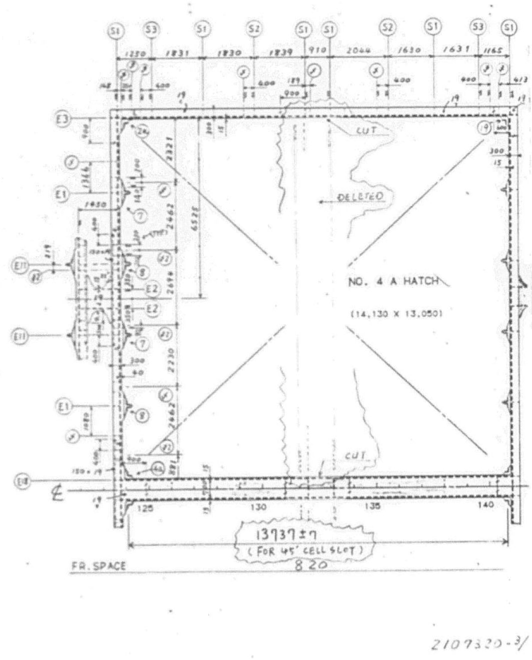
NOTES:-

1. BOTH SIDES TO BE SYMMETRICAL EXCEPT SPECIFIED.
2. TRANS. SECTIONS TO BE "LOOKING FORE" EXCEPT SPECIFIED.
3. REFER TO "CONSTRUCTION DETAILS (DWG NO. 2100811)" FOR STRUCTURAL DETAILS OF MEMBERS, ETC. EXCEPT SPECIFIED.
4. REFER TO "WELDING TABLE (DWG NO. 2100832)" FOR LEG LENGTH OF WELDING EXCEPT SPECIFIED.

備 考:-

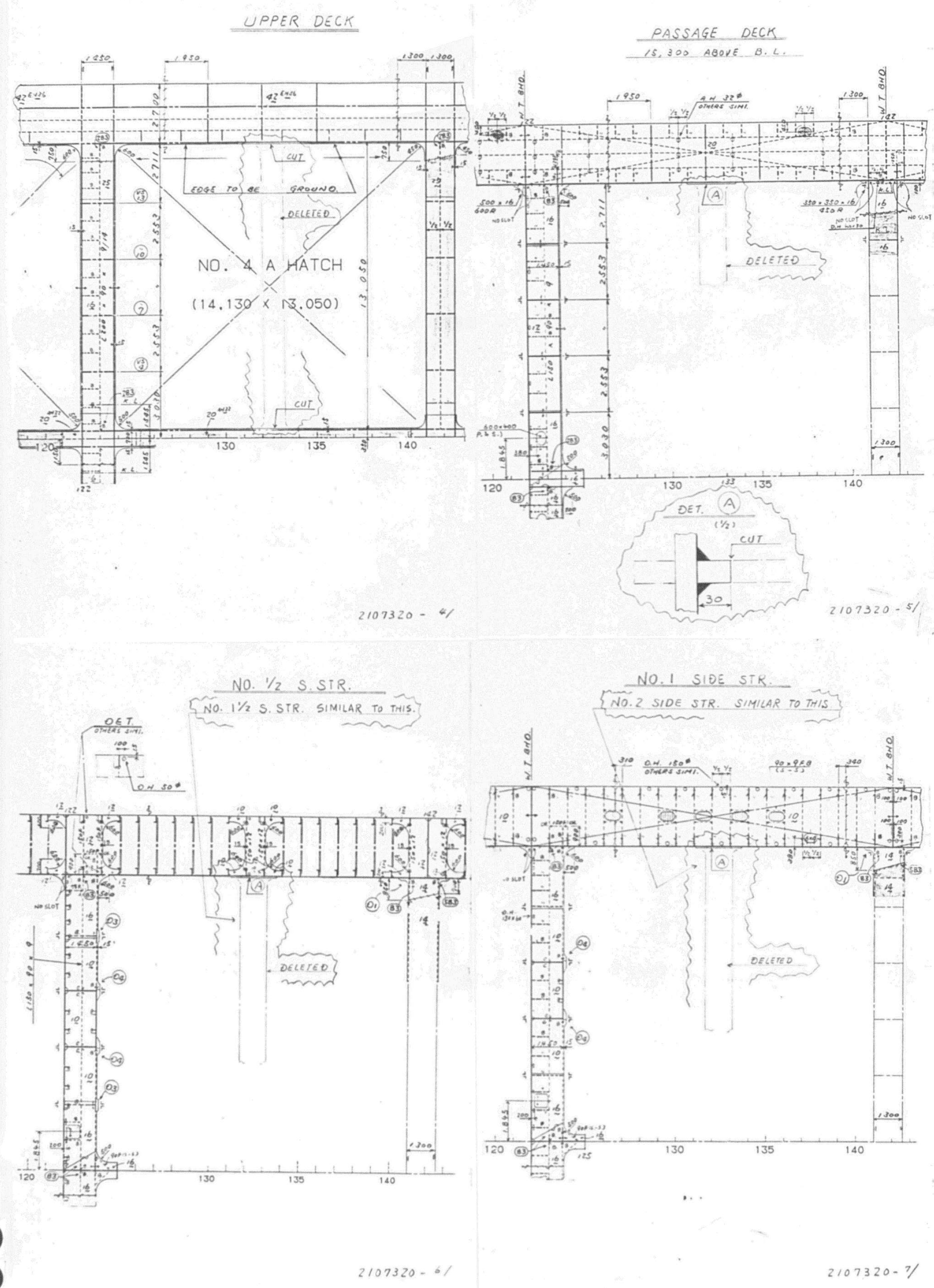
1. 特記の他は、両舷対称とする。
2. 横断面図は、特記の他は後面を示す。
3. 構造詳細については、特記の他は"構造詳細図(図番2100811)"を参照のこと。
4. 溶接脚長については、特記の他は"溶接脚長表(図番2100832)"を参照のこと。

HATCH COAMING TOP PLAN
NO. 4 HOLD

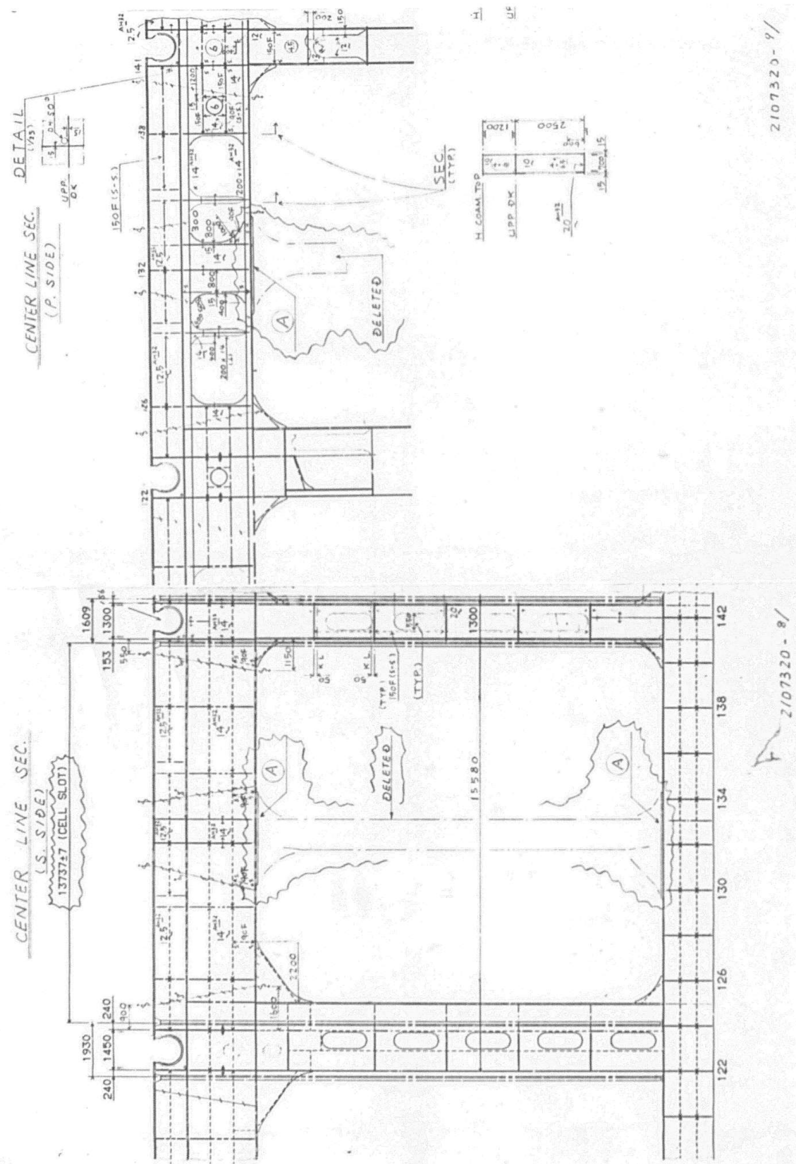


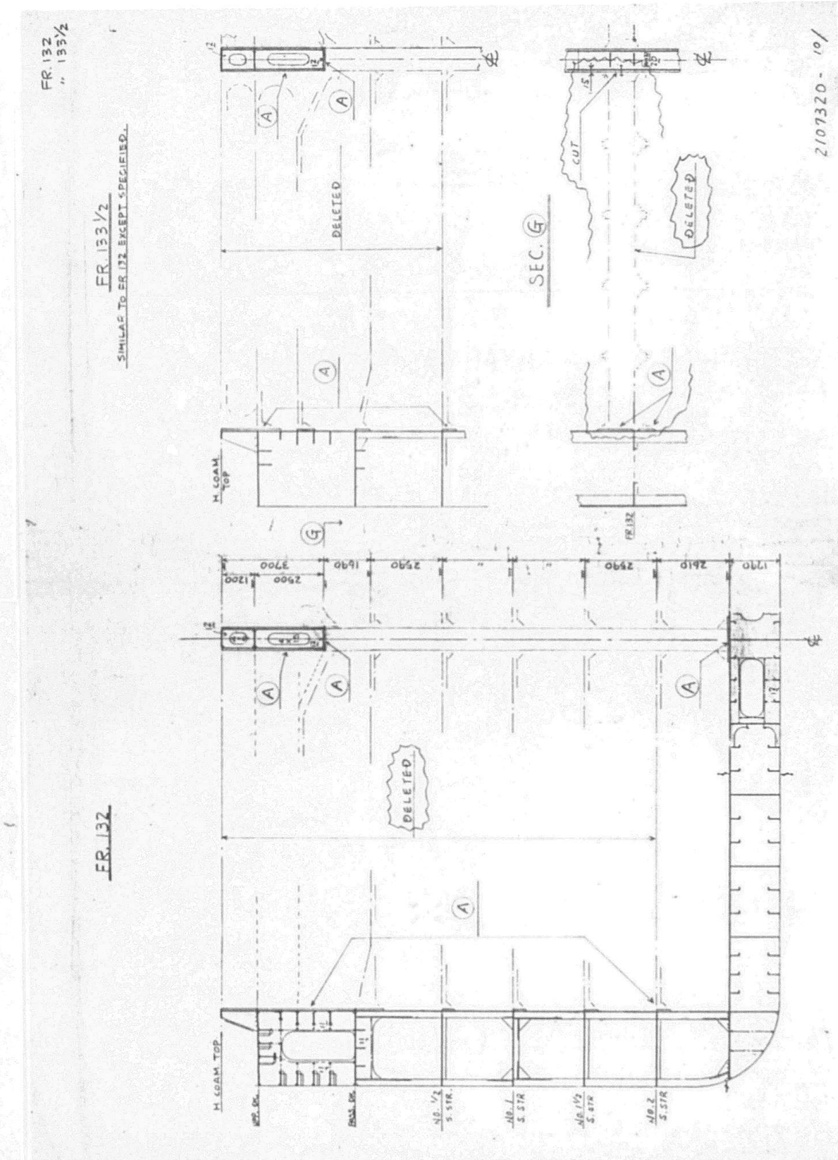
2107320-2/

2107320-3/



UPPER DECK
NO. 4 A HATCH
(14,130 X 13,050)
EDGE TO BE GROUND
CUT
DELETED
2107320 - 4/
PASSAGE DECK
15,300 ABOVE B.L.
W.T BHD.
DELETED
DET. (A) (1/2)
CUT
30
2107320 - 5/
NO. 1/2 S. STR.
NO. 1 1/2 S. STR. SIMILAR TO THIS.
DET. OTHERS SIMI.
DELETED
2107320 - 6/
NO. 1 SIDE STR.
NO. 2 SIDE STR. SIMILAR TO THIS
W.T BHD.
DELETED
2107320 - 7/


CENTER LINE SEC.
(P. SIDE)
DETAIL
SEC.
(TYP.)
DELETED
2107320-9/
CENTER LINE SEC.
(S. SIDE)
1373+7 (CELL SLOT)
15580
2107320-8/


FR.132
" 133½
FR.133½
SIMILAR TO FR.132 EXCEPT SPECIFIED.
SEC. G
CUT
DELETED
2107320-10/
FR.132
H COAM TOP

737

APPROVAL OF OWNER & REGULATORY BODIES

ALT. NO.	OWNER DATE	OWNER LETTER NO.	USCG DATE	USCG LETTER NO.	ABS DATE	ABS LETTER NO.	USPH DATE	USPH LETTER NO.
ORIGINAL	6 FEB '87	2			11 FEB '87	T-P-2		

FINISHEDPLAN

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SHIPYARD AND SHIP'S NO. & NAME			
MITSUI TAMANO		MITSUBISHI KOBE	
NO.1323	DOCTOR LYKES	NO.1158	JAMES LYKES
NO.1324	ALMERIA LYKES	~~NO.1159~~	~~JOSEPH LYKES~~
NO.1325	TILLIE LYKES	~~NO.1164~~	~~SOLON TURMAN~~

MITSUI ENGINEERING & SHIPBUILDING CO.,LTD.
TAMANO WORKS

SHIP DESIGN DEPARTMENT — SHIP'S NO. 1325 — SHIP'S NAME TILLIE LYKES

STRUCTURE DESIGN SEC.

APL MODIFICATION

コンテナー支持構造改造図(第1 後部)

MODIFICATION PLAN OF NO. 1 HOLD (AFT) CONST. SUPP. (40'/45' → 40')

LYKES REF. NO. 120513 — MITSUI DRAWING NO. 2107321

(SHEETS WITH COVER)

PLAN RECORD

ALT. NO.	MARK	ALTERATION/DESCRIPTION	DATE & SIGNATURE
		THIS DRAWING WAS PREPARED FOR APL MODIFICATION, AND CONCERNED LYKE DRAWINGS ARE AS FOLLOWS. (DWG. NAME) (MES DWG NO.) (1) CARGO HOLD CONSTRUCTION (NO.1 HOLD) 2101011 (2) CONT. SUPPORT CONST. (NO.1 H.) (PEDESTAL) 2107311 & 2107317 (3) HATCH COAMING 2101311	
		PREPARED FOR S.NO. 1323 AS FINISHED PLAN. MADE APPLICABLE TO S.NO. 1324 AND S.NO. 1325.	FEB. 18 '87 Y. HAYASHI

DWG. NO. 2107321 - 2/

NOTES:-

1. BOTH SIDES TO BE SYMMETRICAL EXCEPT SPECIFIED.
2. TRANS. SECTIONS TO BE "LOOKING FORE" EXCEPT SPECIFIED.
3. REFER TO "CONSTRUCTION DETAILS (DWG NO. 2100811)" FOR STRUCTURAL DETAILS OF MEMBERS, ETC. EXCEPT SPECIFIED.
4. REFER TO "WELDING TABLE (DWG NO. 2100832)" FOR LEG LENGTH OF WELDING EXCEPT SPECIFIED.

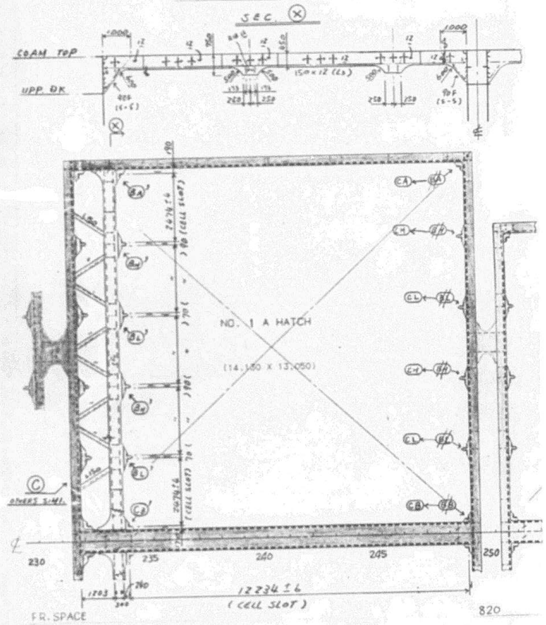
備 考:-

1. 特記の他は，両舷対称とする。
2. 横断面図は，特記の他は後面を示す。
3. 構造詳細については，特記の他は「構造詳細図（図番2100811）」を参照のこと。
4. 溶接脚長については，特記の他は「溶接脚長表（図番2100832）」を参照のこと。

2107321 - 3/

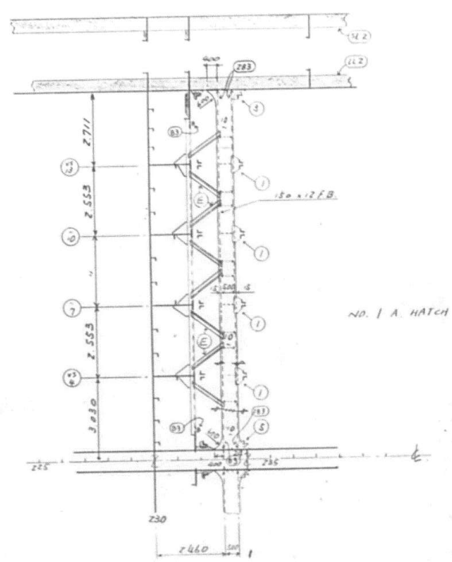
HATCH COAM TOP PLAN

NO 1 HOLD



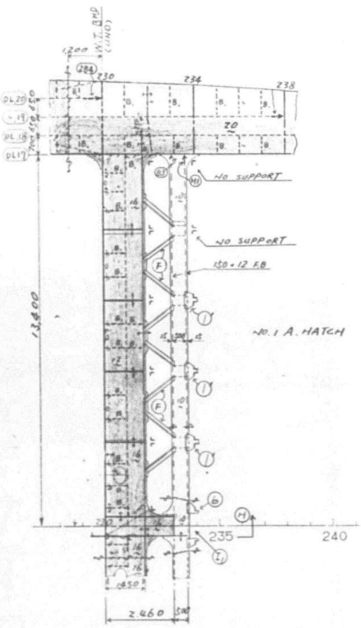
2107321 - 4/

Ⓩ PLAN
(17 400 ABOVE B.L.)



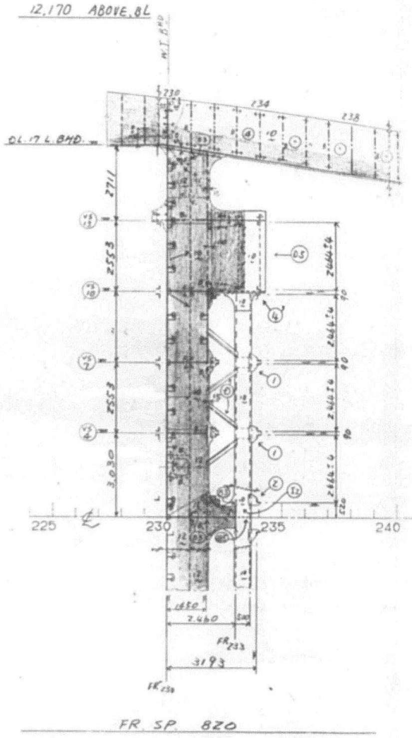
Z107321-5/

PASSAGE DECK
15 300 ABOVE B.L.



Z107321-6/

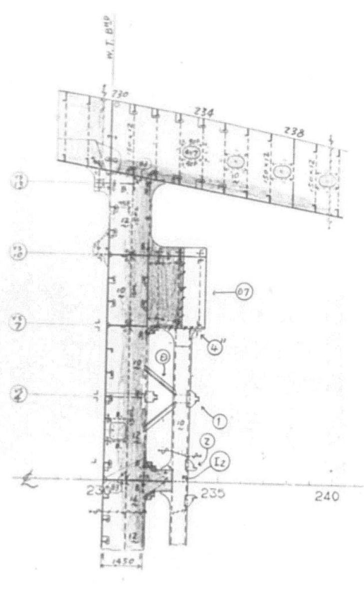
NO. 1/2 S. STR.
12,170 ABOVE BL



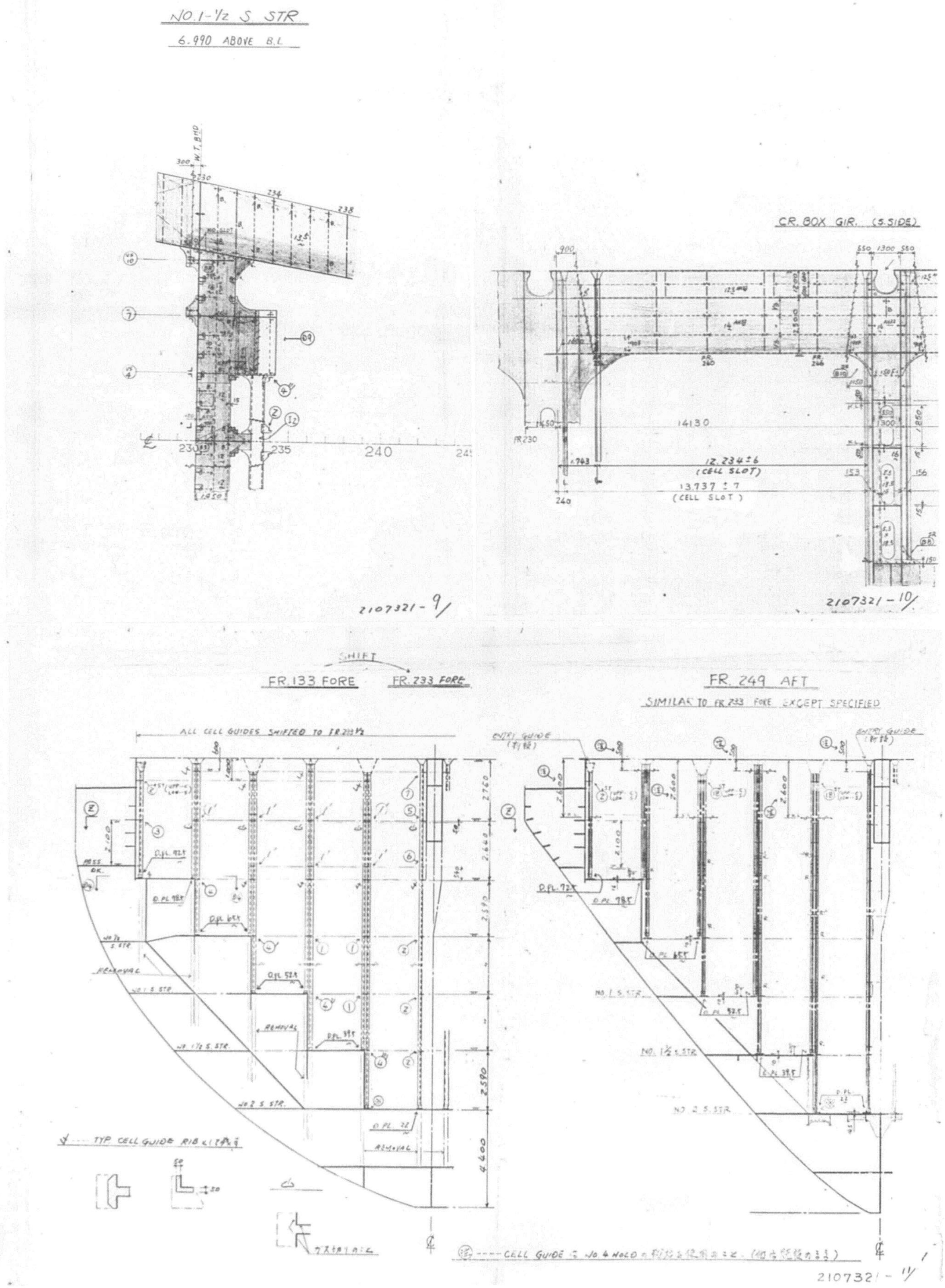
FR. SP. 820

Z107321-7/

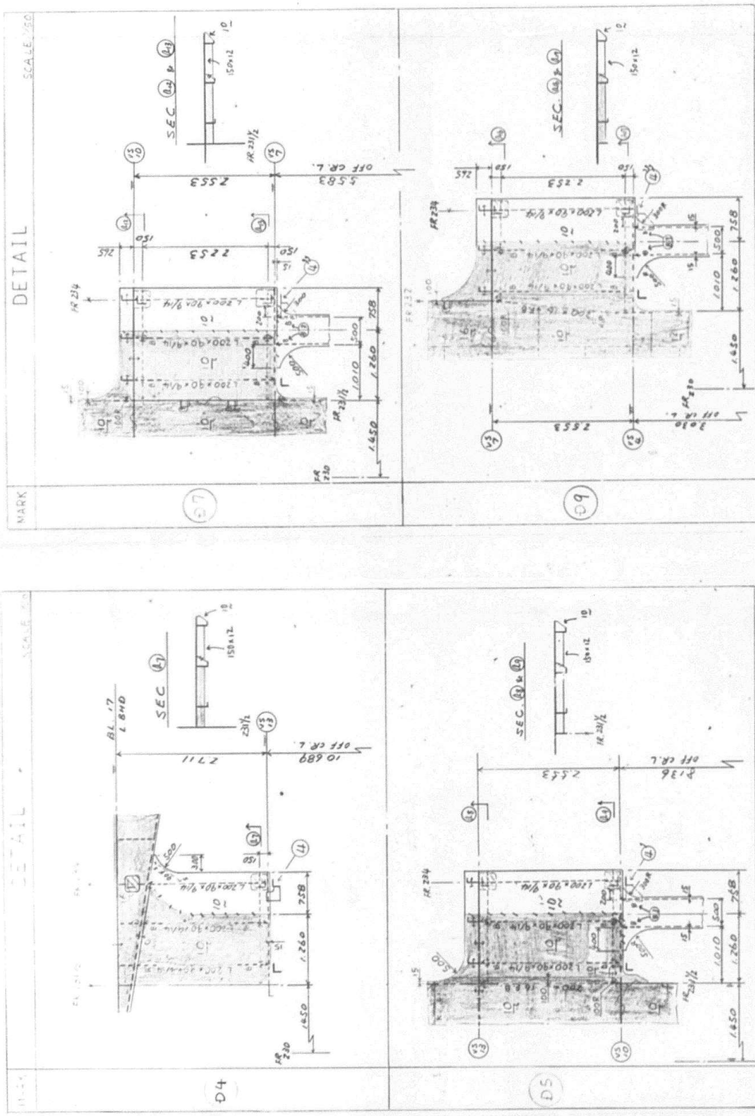
NO. 1 S. STR.
9,580 ABOVE B.L

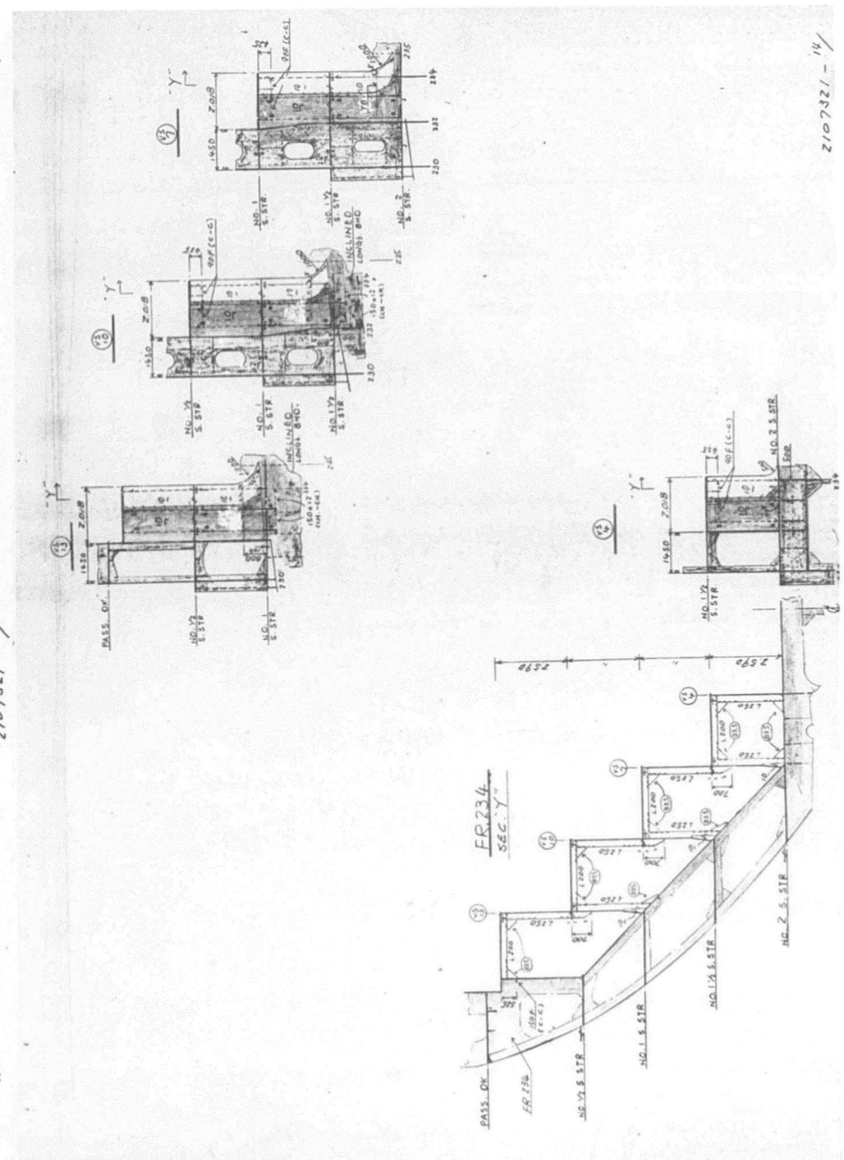


Z107321-8/

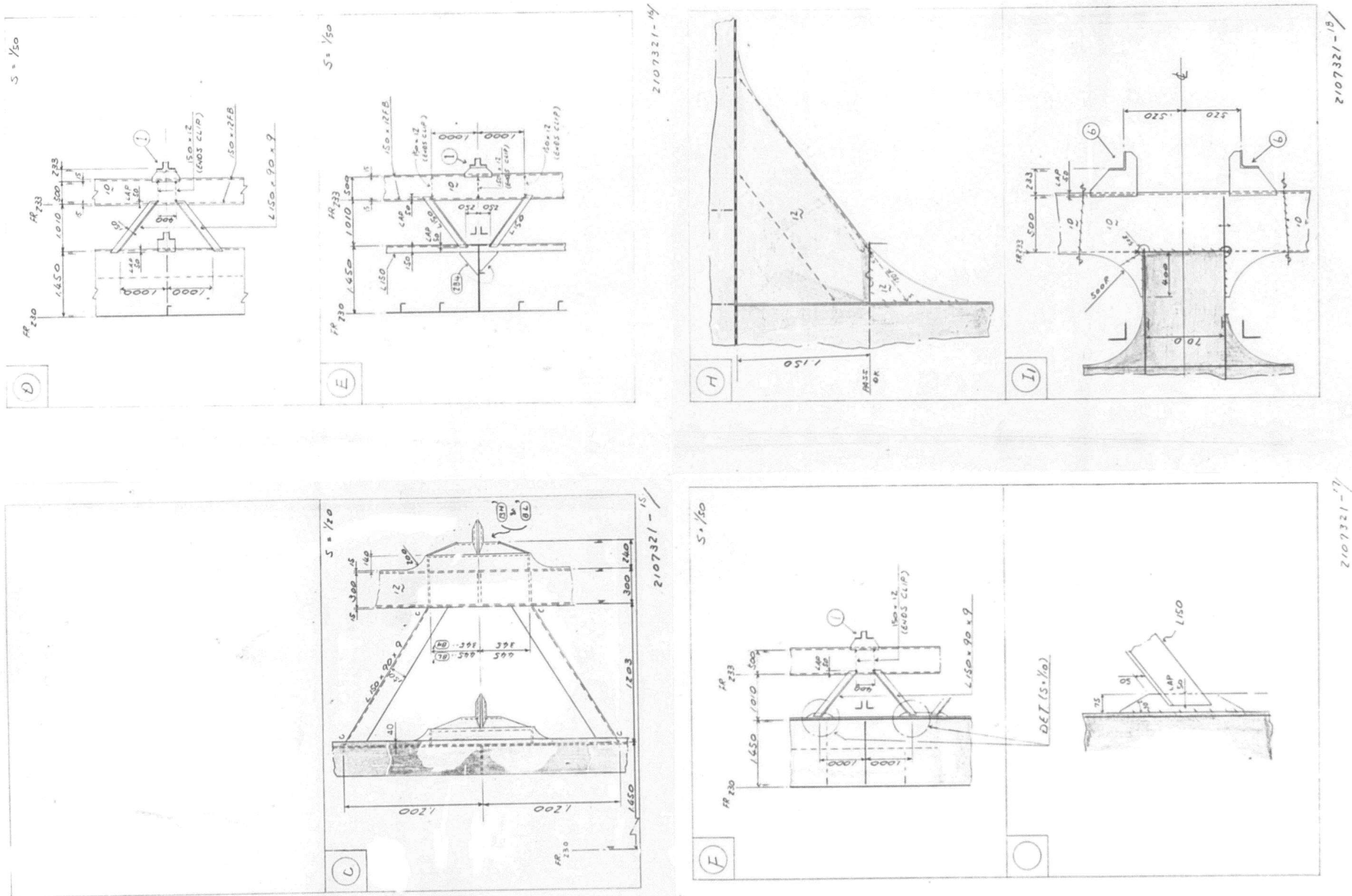


NO.1-1/2 S. STR.
6.990 ABOVE B.L.
CR. BOX GIR. (S.SIDE)
14130
12.234±6 (CELL SLOT)
13.737±7 (CELL SLOT)
2107321-9/
2107321-10/
FR.133 FORE
SHIFT
FR.233 FORE
FR. 249 AFT
SIMILAR TO FR.233 FORE EXCEPT SPECIFIED
ALL CELL GUIDES SHIFTED TO FR.233 1/2
ENTRY GUIDE
REMOVAL
TYP CELL GUIDE RIB
CELL GUIDE
2107321-11/

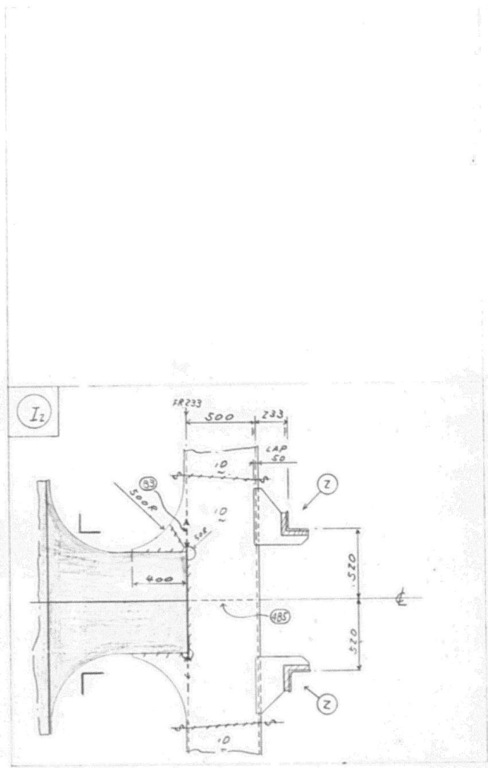

DETAIL
2107321 - 13
2107321 - 12
D7
D9
D4
D5


2107321 - 14
FR 234
SEC 'Y'

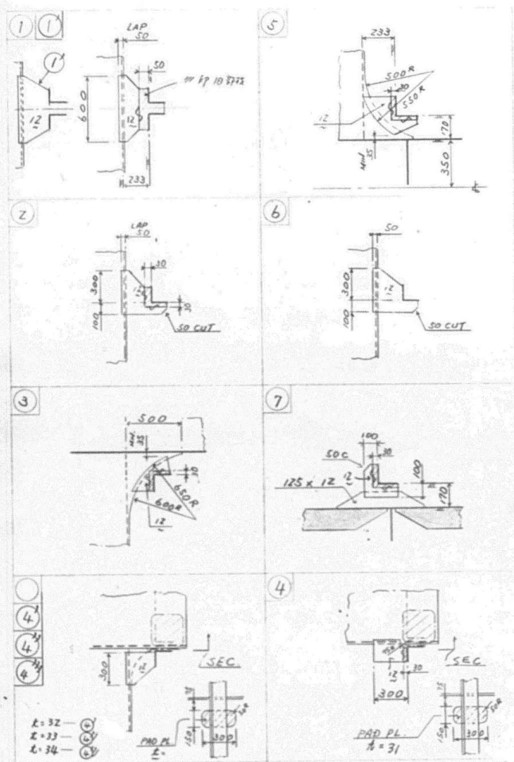
741


2107321-14
2107321-18
2107321-15
2107321-17
S = 1/50
S = 1/20
DET (S=1/10)

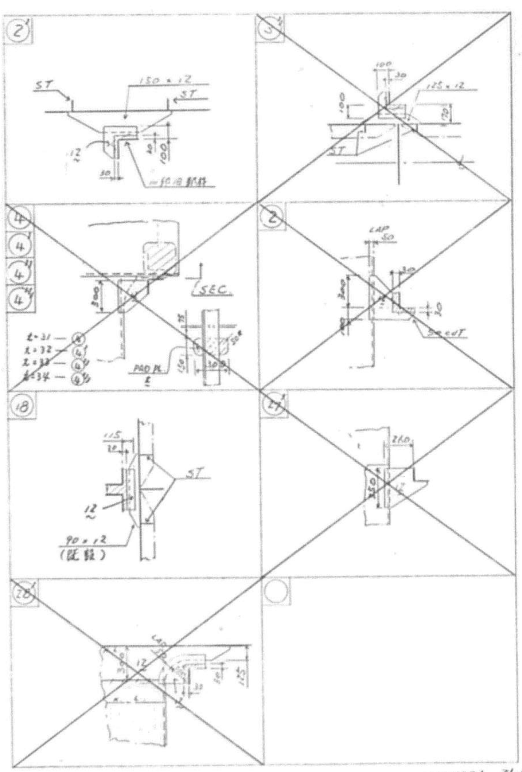
742



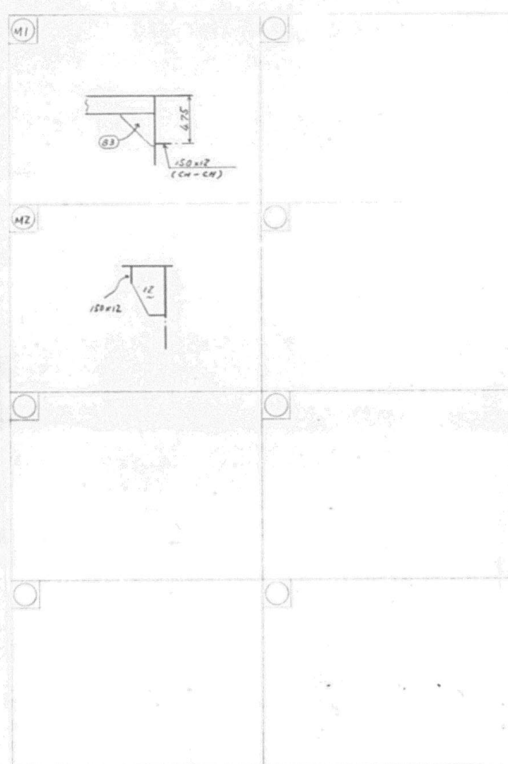
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2107321-20

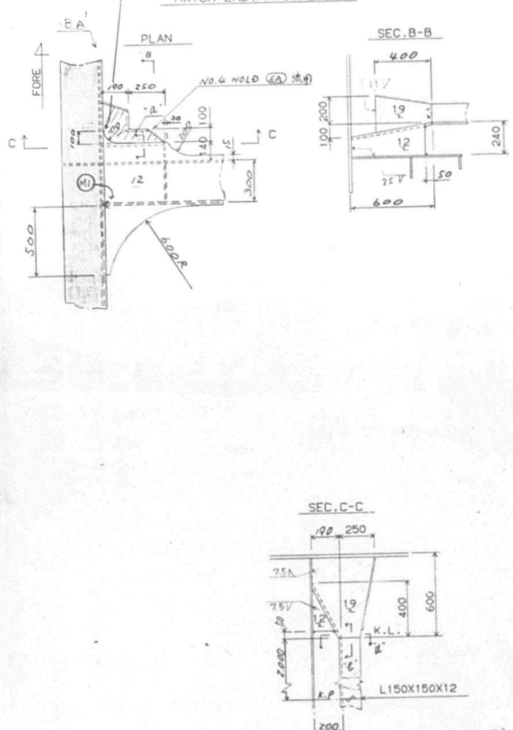


2107321-21



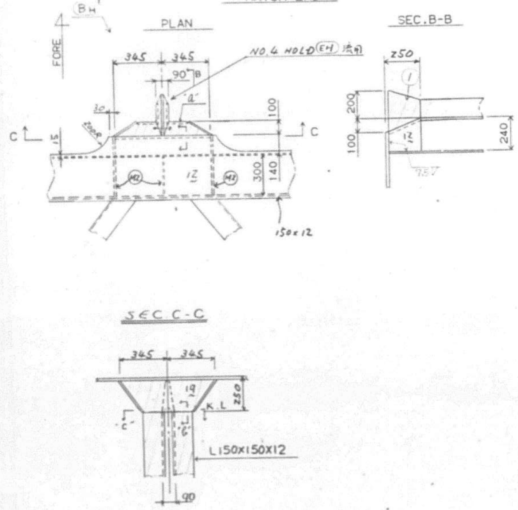
2107321-22

(EA) ENTRY GUIDE
HATCH END (HATCH END)



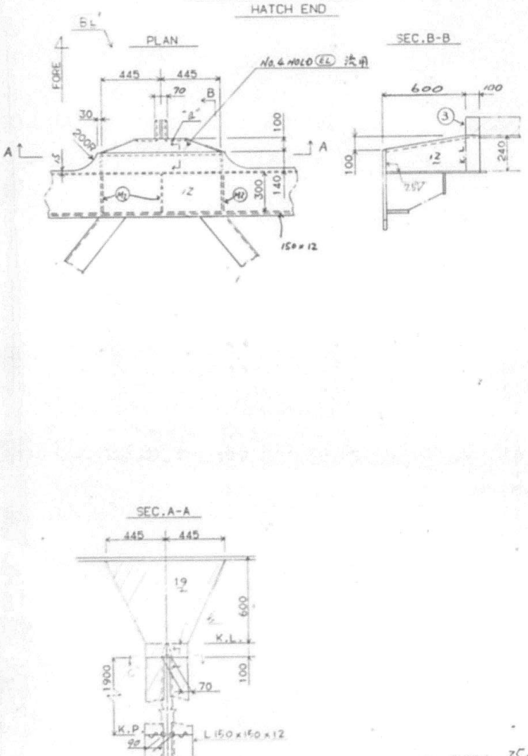
2107321-23

(BH) ENTRY GUIDE
HATCH END



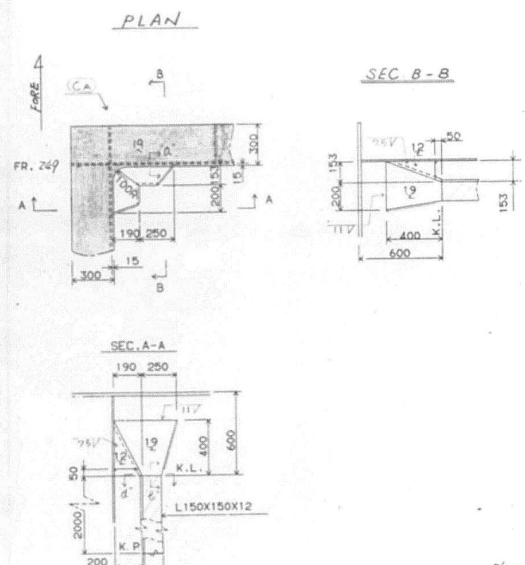
2107321-24

(BL) ENTRY GUIDE
HATCH END



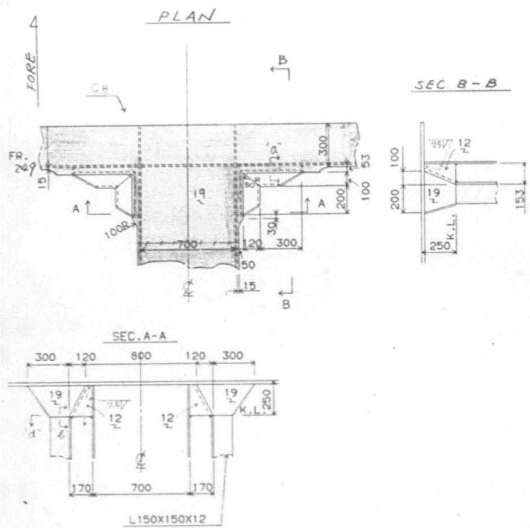
2107321-25

(CA) ENTRY GUIDE
MID-HOLD (AT SIDE)
(新設)



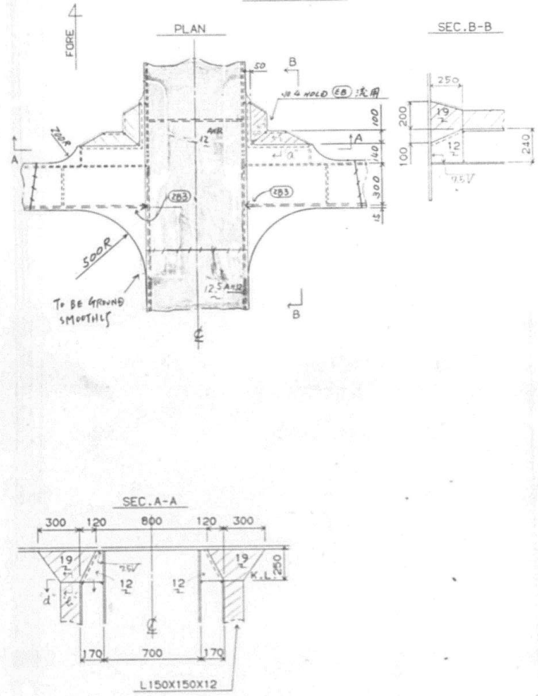
2107321-26

(CB) ENTRY GUIDE
MID-HOLD
(新設)



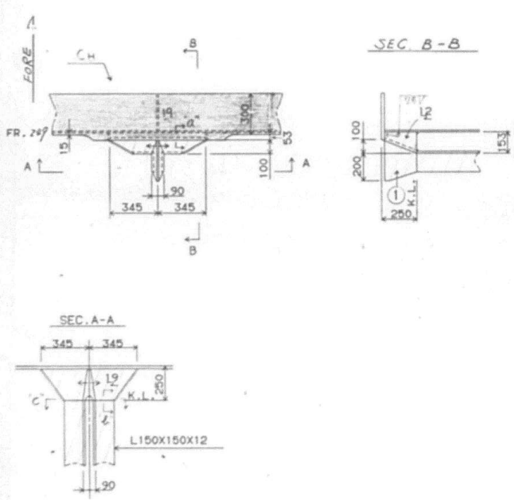
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(CB) ENTRY GUIDE
HATCH END



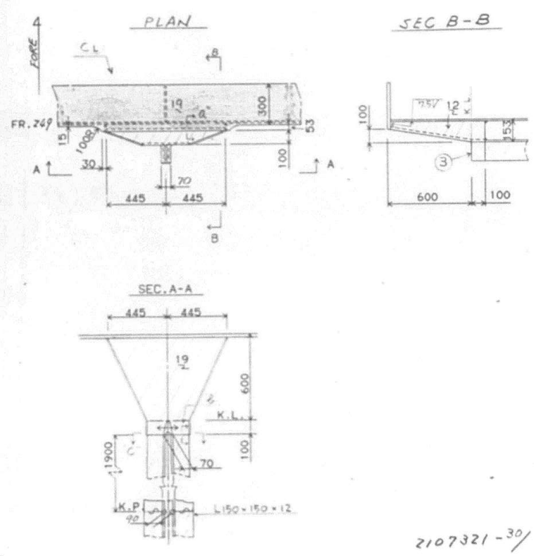
2107321-28

(CH) ENTRY GUIDE
MID-HOLD
NO.4 A HATCH (FR131½) の ENTRY GUIDE (BH) を (CH) に変更する.



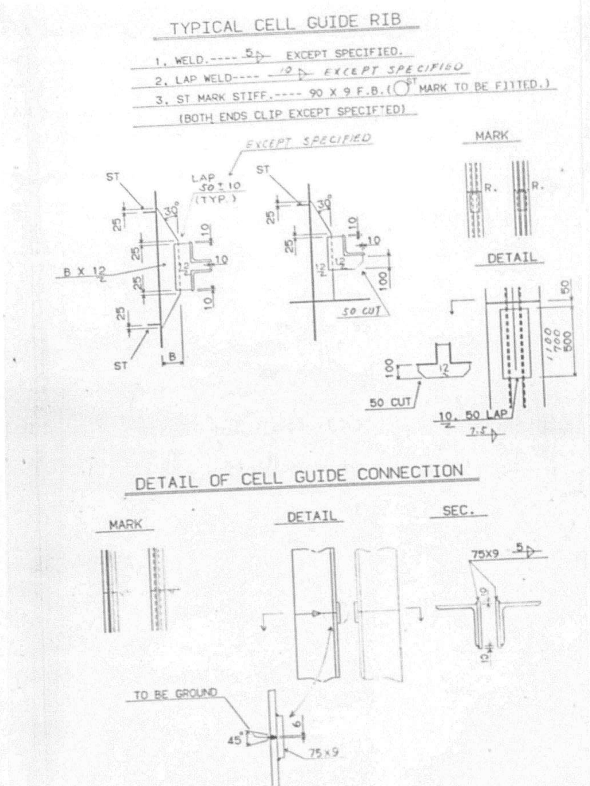
2107321-29

(CL) ENTRY GUIDE
MID-HOLD
NO.4 A. HATCH (FR131½) の ENTRY GUIDE (DL) を (CL) に変更する.

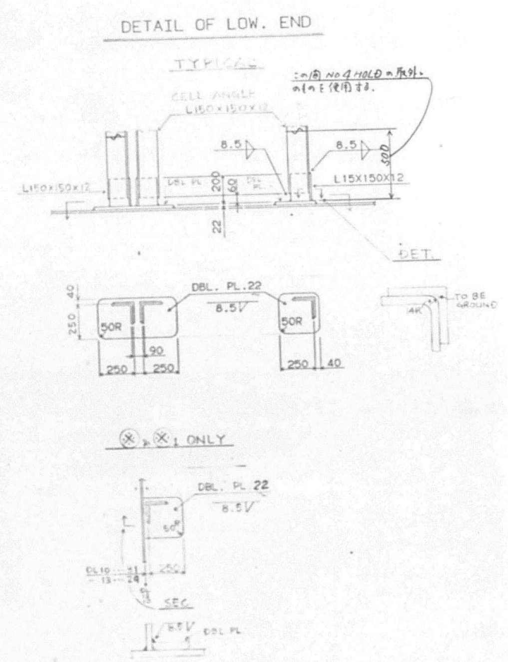


2107321-30

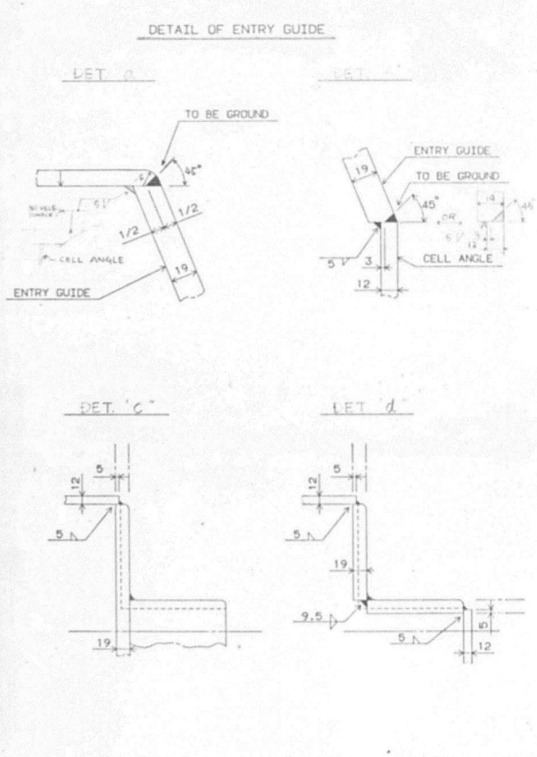
745



2107321-31

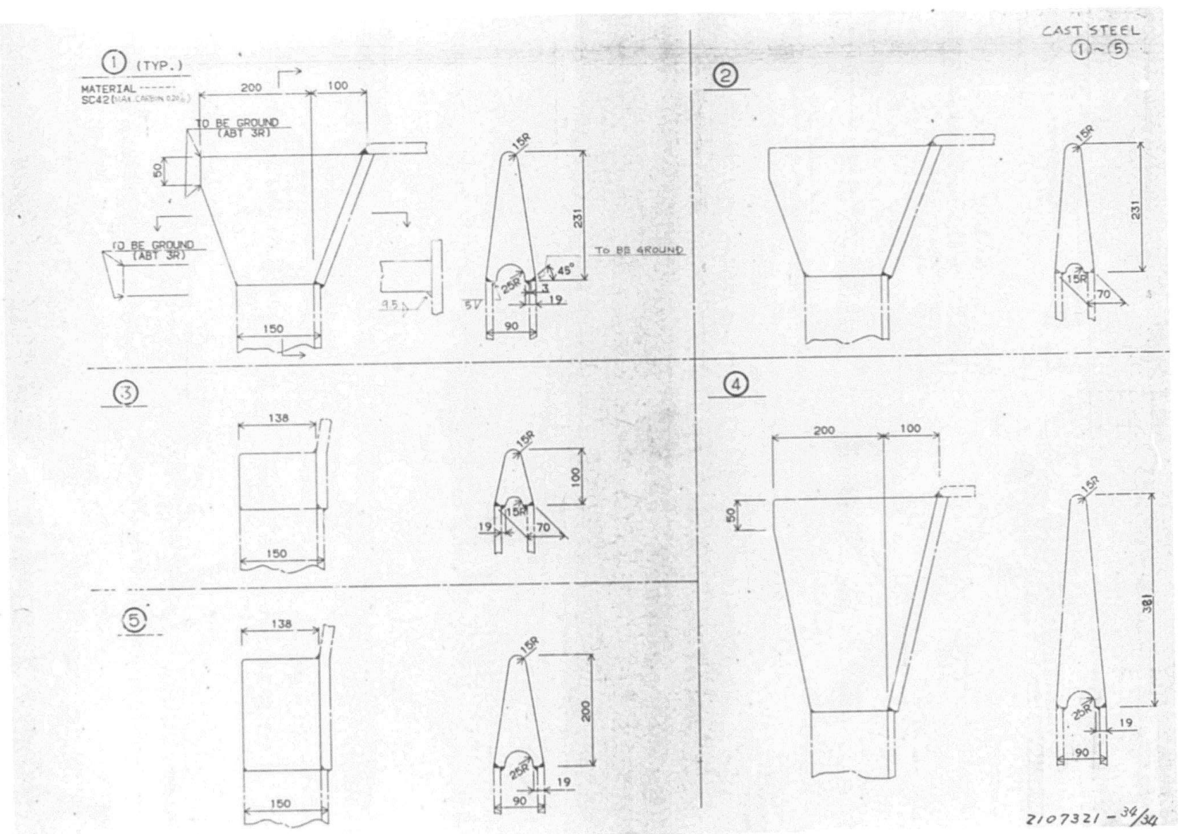


2107321-32



2107321-33

746


CAST STEEL
①~⑤
① (TYP.)
MATERIAL
SC42
TO BE GROUND (ABT 3R)
TO BE GROUND (ABT 3R)
To BE GROUND
②
③
④
⑤
2107321 - 34/34

747

APPROVAL OF OWNER & REGULATORY BODIES								
ALT. NO.	OWNER		USCG		ABS		USPH	
	DATE	LETTER NO.	DATE	LETTER NO.	DATE	LETTER NO.	DATE	LETTER NO.
ORIGINAL	JAN. 15 1986	OFTS/M96-1154						

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SHIPYARD AND SHIP'S NO. & NAME			
MITSUI TAMANO		MITSUBISHI KOBE	
NO.1323	DOCTOR LYKES	NO.1158	JAMES LYKES
NO.1324	ALMERIA LYKES	NO.1159	JOSEPH LYKES
NO.1325	TILLIE LYKES	NO.1164	SOLON TURMAN

MITSUI ENGINEERING & SHIPBUILDING CO., LTD.
TAMANO WORKS FINISHED PLAN

SHIP DESIGN DEPARTMENT MANAGER
SHIP'S NO. **1325**
SHIP'S NAME **TILLIE LYKES**

CO-ORDINATION SECTION
SEC. CHIEF
ASSIST. CHIEF
CHARGE
STAFF
DATE (TEL.)

OPENING ARRANGEMENT ON EXPOSED PART

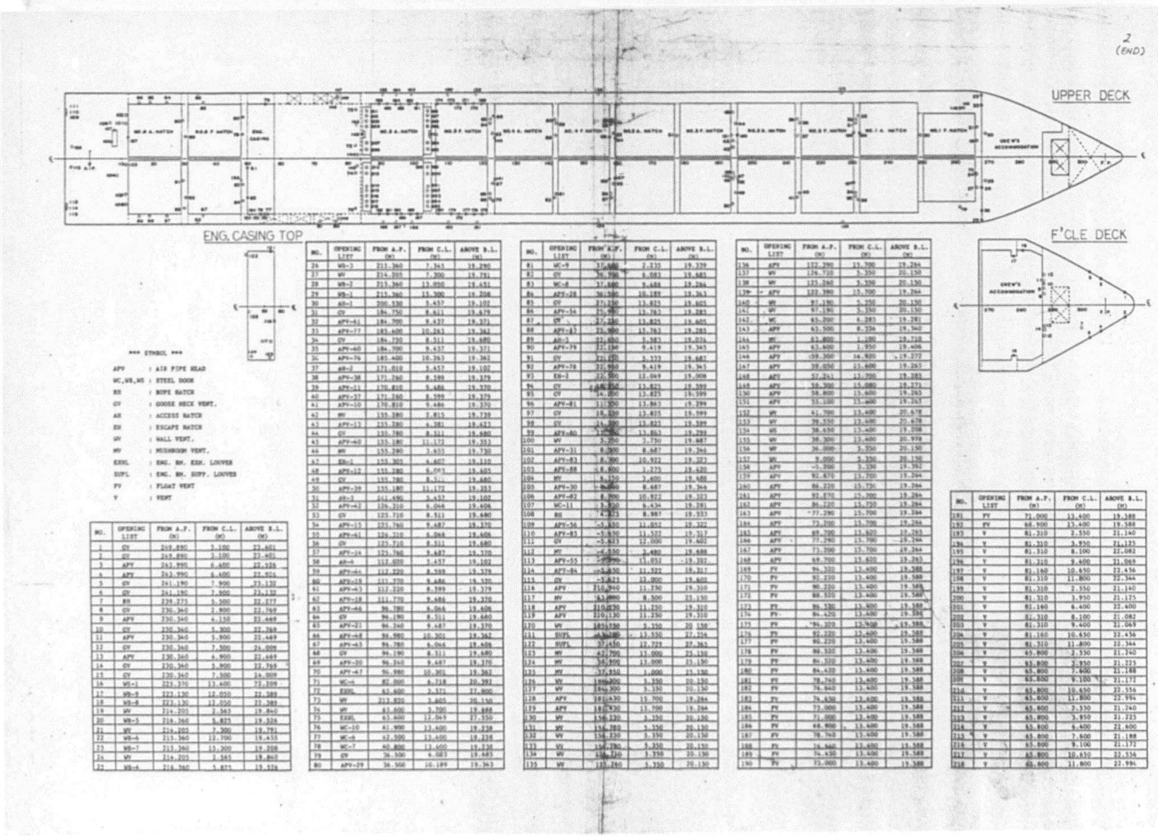
JOB NO. TS1323/24/25
JOBCLASSIF. NO.
SCALE
LYKES REF. NO. 160201
MITSUI DRAWING NO. 1102133

(3 SHEETS WITH COVER)

PLAN RECORD

ALT. NO.	MARK	ALTERATION/DESCRIPTION	DATE & SIGNATURE
		PREPARED FOR S. NO. 1323 AS FINISHED PLAN. MADE	NOV. 10, 1986
		APPLICABLE TO S. NO. 1324 AND S. NO. 1325	K.A. MA

2 (END)



APPROVAL OF OWNER & REGULATORY BODIES

ALT. NO.	OWNER		USCG		ABS		USPH	
	DATE	LETTER NO.	DATE	LETTER NO.	DATE	LETTER NO.	DATE	LETTER NO.
ORIGINAL	[illegible]	SFTS/MES-522			[illegible] AUG '86	J-8-2		
1ST REV	[illegible] SEP '86	TAM/91			19 SEP '86	J-8-2		
1ST PART REV	[illegible] SEP '86	TAM/91			[illegible] OCT '86	J-8-2		
2ND PART REV	[illegible]	TAM/115			12 DEC '86	J-8-2		

FINISHEDPLAN

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SHIPYARD AND SHIP'S NO. & NAME			
MITSUI TAMANO		MITSUBISHI KOBE	
NO.1323	DOCTOR LYKES	NO.1158	JAMES LYKES
NO.1324	ALMERIA LYKES	NO.1159	JOSEPH LYKES
NO.1325	TILLIE LYKES	NO.1164	SOLON TURMAN

MITSUI ENGINEERING & SHIPBUILDING CO., LTD.
TAMANO WORKS

SHIP DESIGN DEPARTMENT
MANAGER
STRUCTURE DESIGN SEC.
SEC. CHIEF
ASSIST. CHIEF
STAFF
DATE (TEL. 2230)
JOB NO. TS1323/24/25
JOBCLASSIF. NO.
SCALE 1/200

SHIP'S NO. 1325
SHIP'S NAME TILLIE LYKES

マンホール配置

MANHOLE ARRANGEMENT (INCL. LADD. ARR.)

LYKES REF. NO. 160203
MITSUI DRAWING NO. 2142021

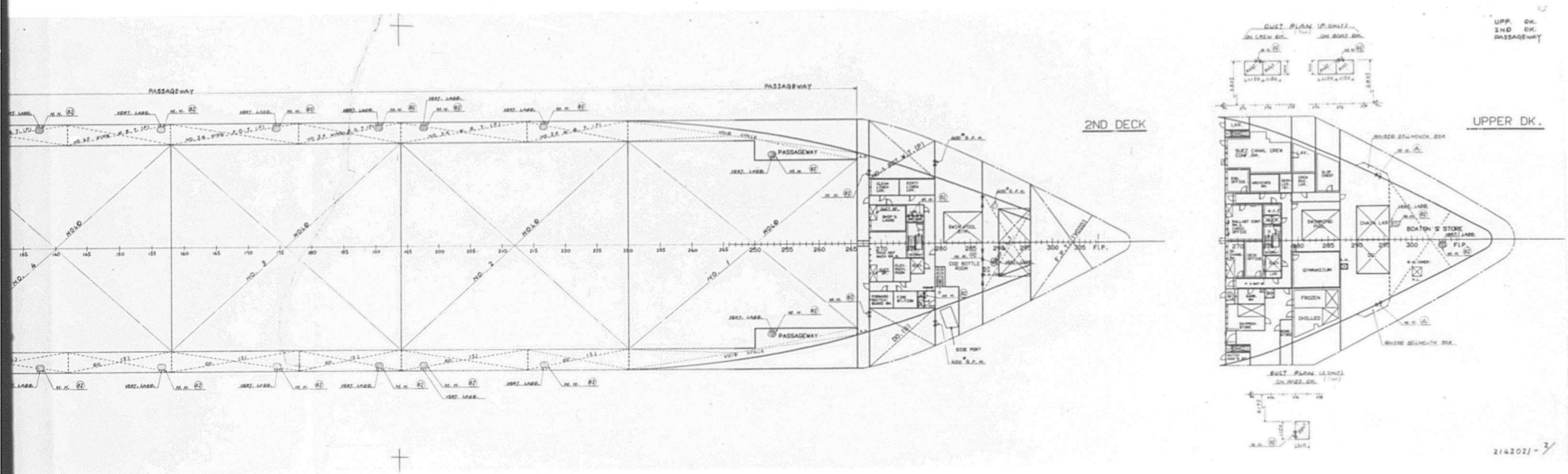
(14 SHEETS WITH COVER)

PLAN RECORD

ALT. NO.	MARK	ALTERATION/DESCRIPTION	DATE & SIGNATURE
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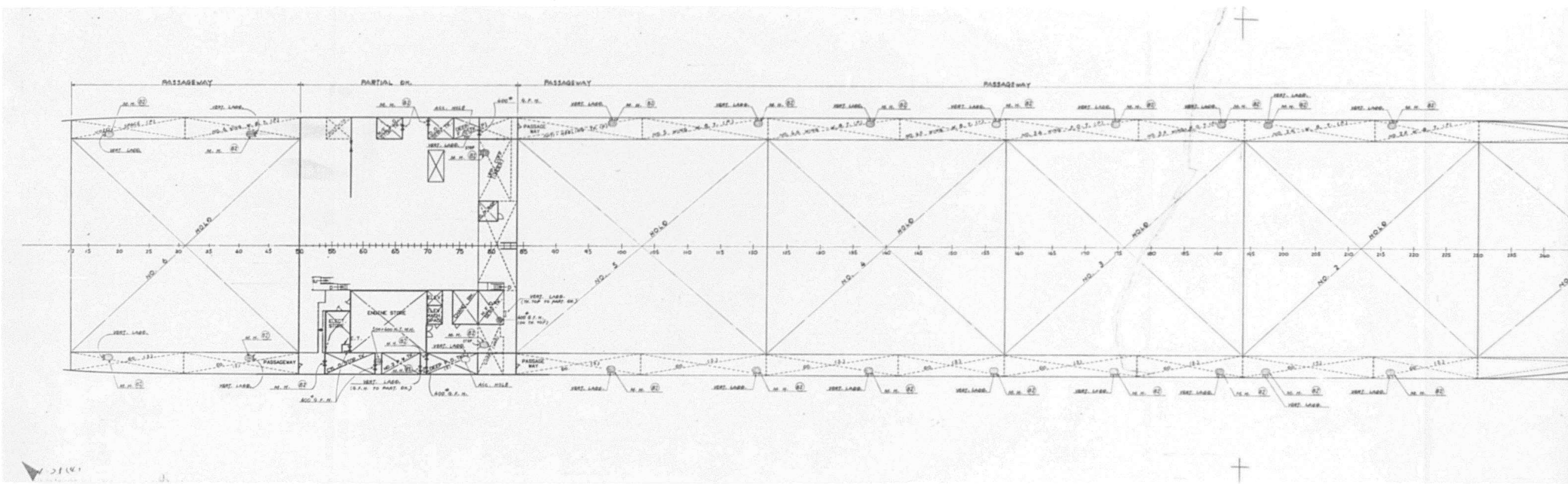
DWG. NO. 2142021-1

749



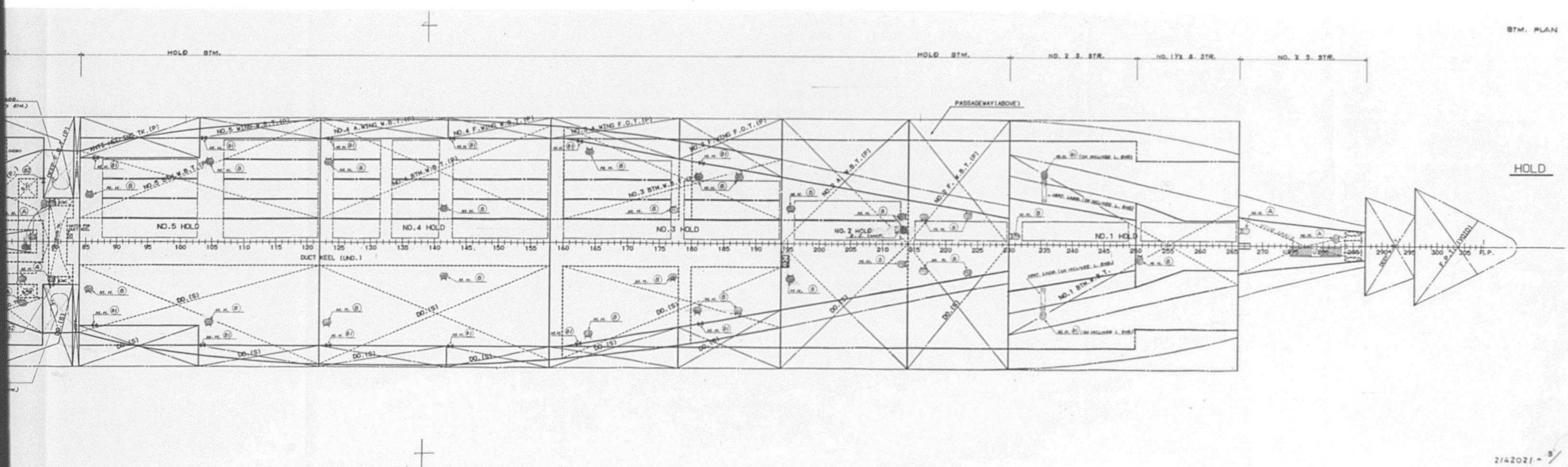
PASSAGEWAY
2ND DECK
UPPER DK.
HOLD
NO. 1
NO. 2
NO. 3
BOATSN'S STORE
GYMNASIUM
FROZEN
CHILLED
F.P.
214202/-3

750



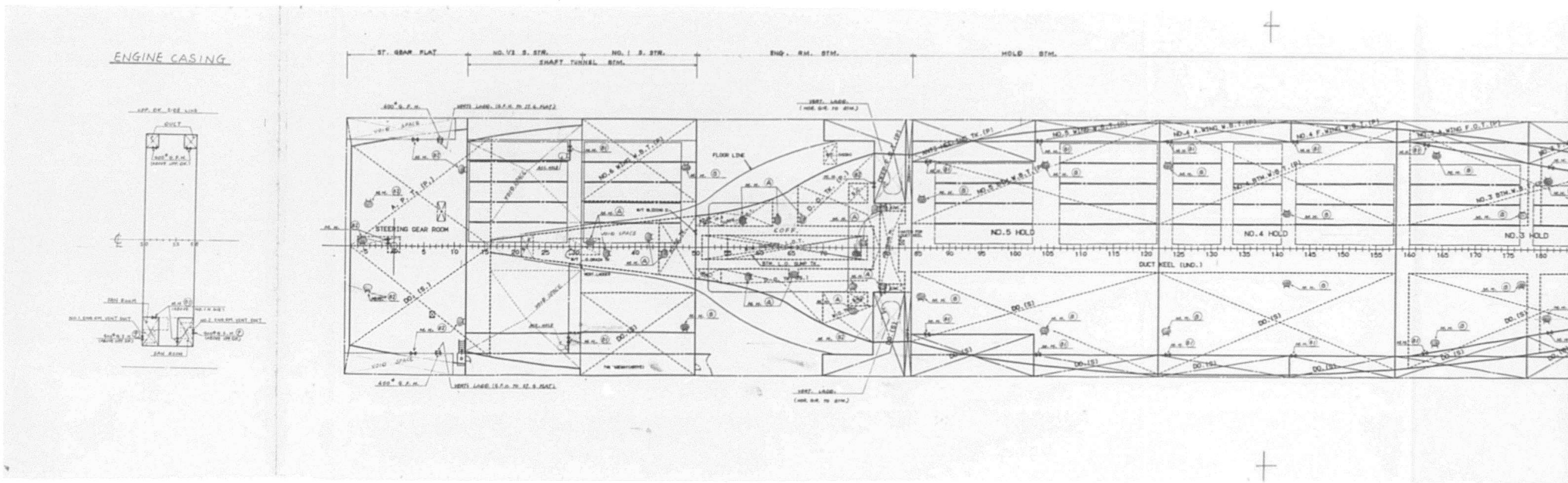
PASSAGEWAY
PARTIAL BH.
PASSAGEWAY
PASSAGEWAY
HOLD
HOLD
HOLD
HOLD
HOLD
NO. 6
NO. 5
NO. 4
NO. 3
NO. 2
ENGINE STORE
PASSAGEWAY

751

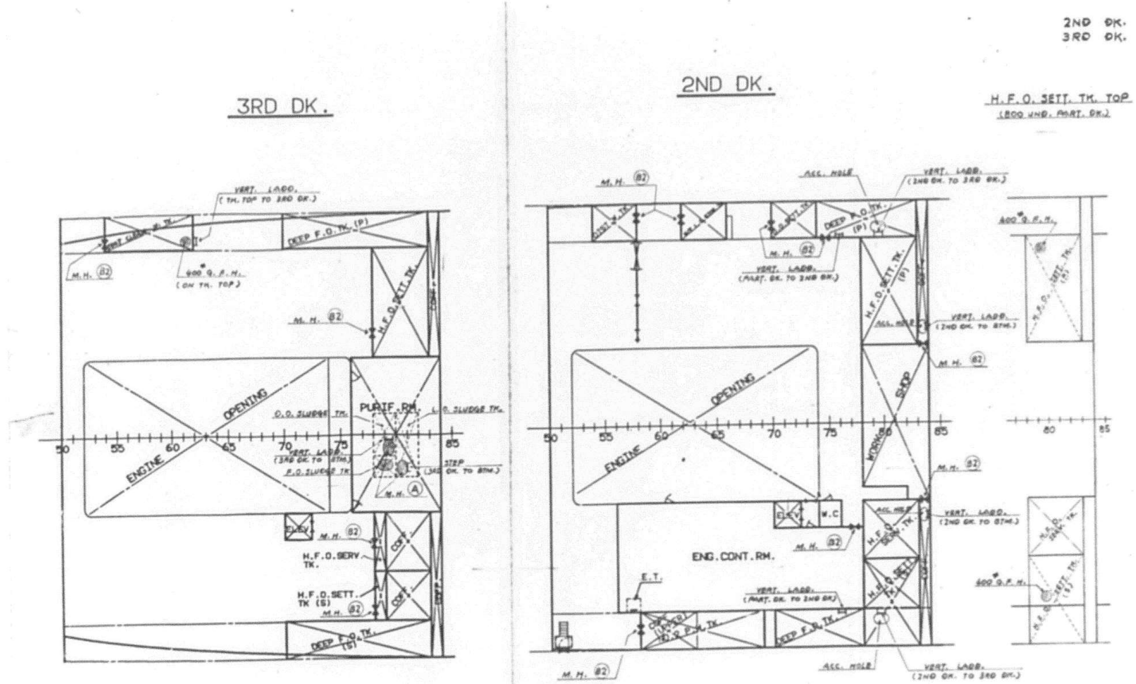


BTM. PLAN
HOLD BTM.
HOLD
PASSAGEWAY (ABOVE)
NO.5 HOLD
NO.4 HOLD
NO.3 HOLD
NO.2 HOLD
NO.1 HOLD
DUCT KEEL (UND.)
F.P.
214202I - 3/

752

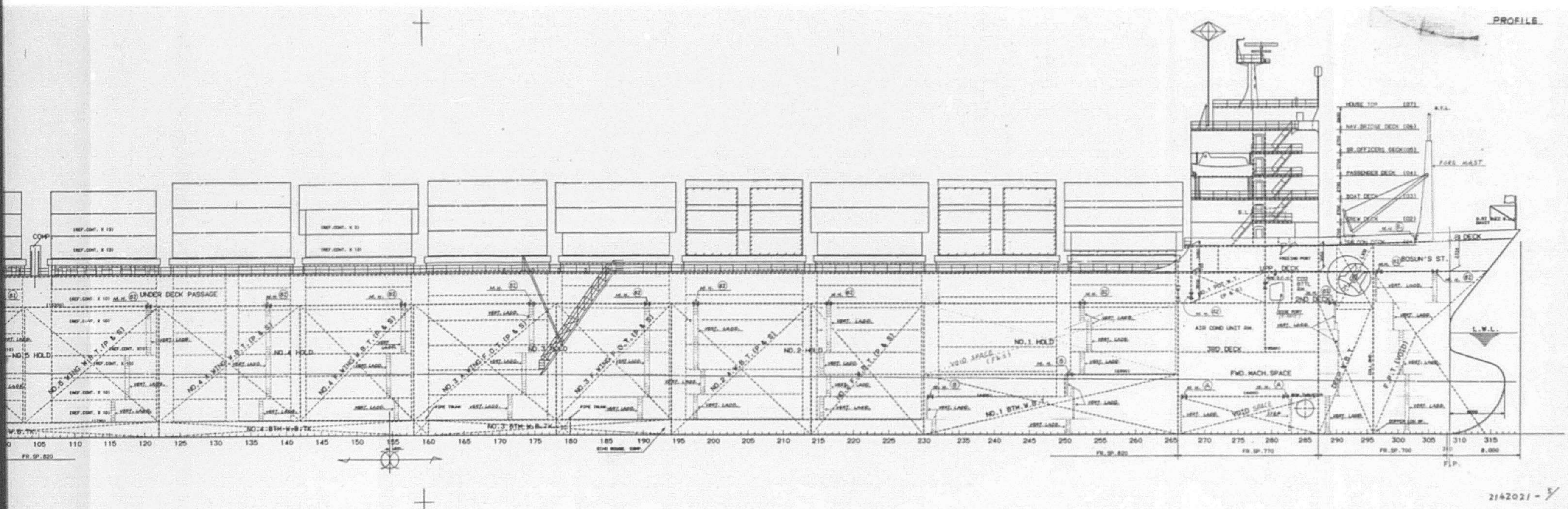

ENGINE CASING
ST. GEAR FLAT
SHAFT TUNNEL BTM.
ENG. RM. BTM.
HOLD BTM.
FLOOR LINE
STEERING GEAR ROOM
COFF.
NO.5 HOLD
NO.4 HOLD
NO.3 HOLD
DUCT KEEL (UND.)

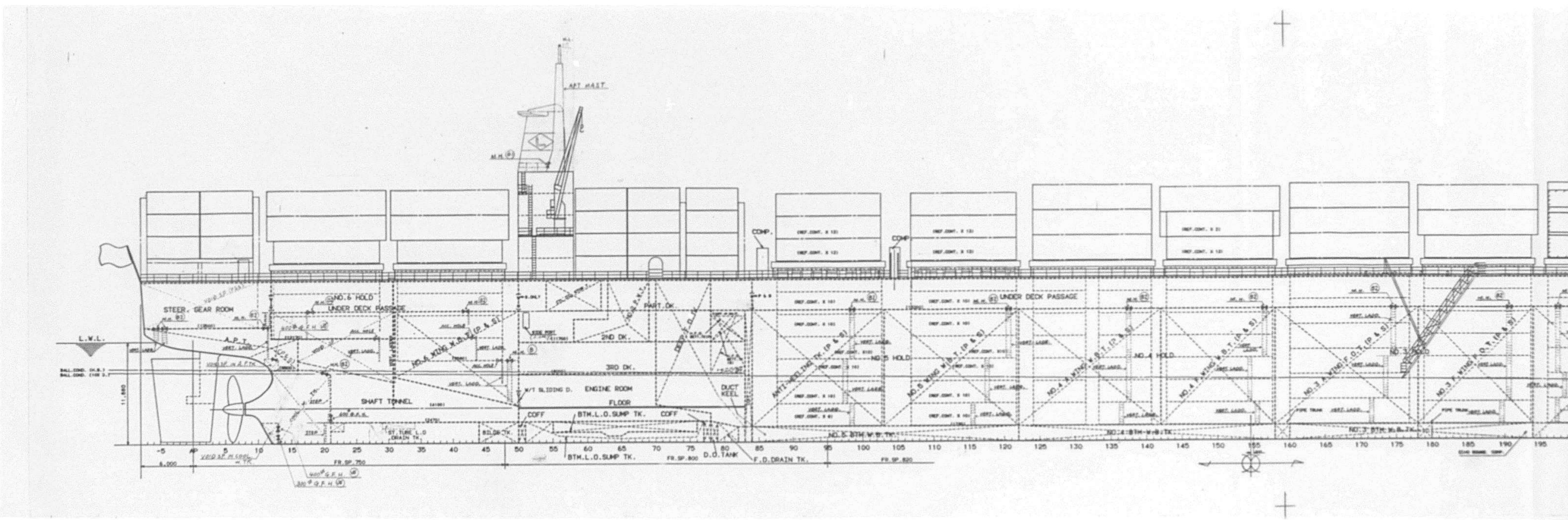
753



2ND DK.
3RD DK.
3RD DK.
2ND DK.
H.F.O. SETT. TK. TOP
ENGINE
OPENING
PURIF. RM.
ENG. CONT. RM.
WORKSHOP
H.F.O. SETT. TK.
H.F.O. SERV. TK.
H.F.O. SETT. TK (S)
DEEP F.O. TK. (P)
DEEP F.O. TK. (S)
M.H.
VERT. LADD.
ACC. HOLE
W.C
E.T.

2142021 - 4


PROFILE
UNDER DECK PASSAGE
NO.5 HOLD
NO.4 HOLD
NO.2 HOLD
NO.1 HOLD
FWD. MACH. SPACE
3RD DECK
AIR COND UNIT RM.
BOSUN'S ST.
FORE MAST
L.W.L.
F.P.
105 110 115 120 125 130 135 140 145 150 155 160 165 170 175 180 185 190 195 200 205 210 215 220 225 230 235 240 245 250 255 260 265 270 275 280 285 290 295 300 305 310 315


APT MAST
STEER. GEAR ROOM
NO.6 HOLD
UNDER DECK PASSAGE
PART DK.
2ND DK.
3RD DK.
ENGINE ROOM
FLOOR
SHAFT TONNEL
COFF
BTM.L.O.SUMP TK.
COFF
DUCT KEEL
D.O.TANK
F.O.DRAIN TK.
COMP.
NO.5 HOLD
UNDER DECK PASSAGE
NO.4 HOLD
L.W.L.

MANHOLE & GAS FREE HOLE LIST

	COMPARTMENT	ABBREVIATED NAME ON M.H. & G.F.H. COVER	PLACE	600×400 M.H. Ⓐ	Ⓑ	Ⓑ1	Ⓑ2	400 φ G.F.H.	400 φ (W) G.F.H.	300 φ (W) G.F.H.	400×800 M.H.
FORE PART	FORE PEAK TANK	F.P.T.	UPP. DK.				2				
	DEEP W. B. TK.	D.W.B.T.	2ND DK.				1	1			
	VOID SPACE (FR.266–287)	VOID	NO. 2 SIDE STR.	2							
	NO. 1 POT. WATER TK.	1 P.W.T.	FR. 268				2				
			FR. 279					2			
	FORE MAST	F.MAST	AT FR. 302 1/2			1					
	DUCT SPACE (IN ACCOMOD.)	DUCT.	ON 2ND DK., CREW DK., BOAT DK.				6				
	RAISED BELLMOUTH BOX	R.B.B.	ON SHELL PL. (FR.296)	2							
HOLD PART	NO. 1 BTM. WATER BALL. TK.	1 B.W.B.T.	NO. 2 SIDE STR.		1						
			NO. 1 1/2 SIDE STR.		1						
	VOID SPACE (P. & S.) (FR 230–266)	VOID	INCLINED L. BHD.			2					
			PASSAGEWAY				2				
	NO. 2F W. B. TK. (P. & S.)	2F W.B.T.	DBL. BTM.		4						
			PASSAGEWAY				2				
	NO. 2A W. B. TK. (P. & S.)	2A W.B.T.	DBL. BTM.		4						
			PASSAGEWAY				2				
	NO. 3 B. W. B. TK. (P. & S.)	3B.W.B.T.	DBL. BTM.		8						
	NO. 3F WING F.O.TK. (P. & S.)	3F F.O.T.	LONGL BHD.			2					
			PASSAGEWAY				2				
	NO. 3A WING F.O.TK. (P. & S.)	3A F.O.T.	LONGL BHD.			2					
			PASSAGEWAY				2				
	NO. 4 B. W. B. TK. (P. & S.)	4B.W.B.T.	DBL. BTM.		4						
	NO. 4F WING W.B.TK. (P. & S.)	4F W.B.T.	LONGL BHD.			2					
			PASSAGEWAY				2				
	NO. 4A WING W.B.TK. (P. & S.)	4A W.B.T.	LONGL BHD.			2					
			PASSAGEWAY				2				
	NO. 5 B. W. B. TK. (P. & S.)	5B.W.B.T.	DBL. BTM.		4						
	NO. 5 WING W.B.TK. (P. & S.)	5 W W.B.T.	LONGL BHD.			2					
			PASSAGEWAY				2				
	ANTI-HEELING TK. (P. & S.)	HEEL. T.	LONGL BHD.			2					
			PASSAGEWAY				2				
	NO. 6 WING W. B. TK. (P. & S.)	6 W W.B.T.	NO. 1 SIDE STR.		2						
			PASSAGEWAY				2				
	VOID SPACE (P. & S.) (FR 12–31)	VOID	FR. 29 BHD.			2					
			PASSAGE WAY				2				
	ECHO SOUND. COMP.	E.S.C.	DBL. BTM. FR.213 1/2 (P.)		1						
ENG. RM.	F.O. DRAIN TK.	F.O.D.T.	DBL. BTM.	2							
	BTM. RESERV L.O. TK.	B.R.L.O.T.	DBL. BTM.	1							
	BTM. L.O. SUMP TK.	B.L.O.S.T.	DBL. BTM.	1							
	D. O. TK. (P. & S.)	D.O.T.	DBL. BTM.	4							
	CLEAN O. TK.	C.O.T.	DBL. BTM.	1							
	W. O. TK.	W.O.T.	DBL. BTM.	1							
	COFF.	COFF.	DBL. BTM.	2							
	DEEP F. O. TK. (P)	D.F.O.T.	FR. 78 BHD.				1	1			
			LONGL BHD.				1				
	DEEP F. O. TK. (S)	D.F.O.T.	LONGL BHD.				1				
			FR. 70 BHD.				1	1			
	H.F.O. SETT. TK. (P. & S.)	F.O.ST.T.	FR. 78 BHD.				2				
			TK. TOP					2			
	COFF.	COFF.	LONGL BHD. (ON 2ND DK.)				2				
	H.F.O. SERV. TK.	F.O.SV.T.	FR. 78 BHD.				1				
			TK. TOP					1			
	D.O. SLUDGE TK.	D.O.S.T.	TK. TOP (ON 3RD DK.)	1							
	F.O. SLUDGE TK.	F.O.S.T.	TK. TOP (ON 3RD DK.)	1							
	L.O. SLUDGE TK.	L.O.S.T.	TK. TOP (ON 3RD DK.)	1							
	SOOT CLEAN W. TK.	S.C.W.T.	FR. 58 BHD. (ON 3RD DK.)				1				
			TK. TOP					1			
	D. O. SETT. TK.	D.O.S.T.	FR. 70 BHD. (ON 2ND DK.)				1				
	M/E L.O. STOR. TK.	M.L.O.S.T.	FR.11 BHD (ON 2ND DK)/FR.68 BHD (ON PART DK)				2				
	DIST. W. TK.	D.W.T.	FR. 58 BHD. (ON 2ND DK.)				1				
	NO. 2 POT. W. TK.	2 P.W.T.	FR.59 BHD (ON 2ND DK)/FR.67 BHD (ON PART DK)				2				
	D. O. SERV. TK.	D.O.SV.T.	FR. 70 BHD. (ON PART. DK.)				1				
	CYL. O. STOR. TK.	C.O.S.T.	FR.68 BHD (ON PART DK)/FR.[illegible] BHD (ON PART DK)				1	1			
	ESCAPE TRUNK (S)	E.T.	FR. 57 BHD. (ON PART DK)					1			
	COFF. (S)	COFF.	PART. DK.								1
	COFF. (P. & S.)	COFF.	PART. DK.				2				
	ENG. CONT. RM.	E.C.RM.	WALL (ON 2ND DK.)				1				
	ENG. CASING (S)	FAN. RM.	WALL OF FAN ROOM (ON UPP. DK.)				2				
	" " (P)	DUCT	" " DUCT (ON NO.1 N.DK.)					2			
	" " (S)	E.RM.VD.	TK50 & 38 WALL						2		
	AFT MAST	A.MAST				1					
SHAFT TUNNEL	BILGE TANK	BIL. T.	DBL. BTM.	1							
	S/T L.O. DRAIN TK.	S.L.O.D.T.	DBL. BTM.	1							
	VOID SPACE	VOID	DBL. BTM.	2							
AFT PART	COOL. W. TK.	C.W.T.	FR. 31 BHD.					1			
			COOL. W. TK. TOP				1				
	VOID SPACE IN COOL. W. TK.	VOID	VOID SP. TOP						1	1	
	AFT PEAK TK. (P. & S.)	A.P.T.	ST. G. FLAT				4				
	VOID SPACE IN A.P. TK.	VOID	FR. 13 BHD.						1		
	RUDD. TRUNK	R. TR.	ST. G. FLAT				1				
		R. TR.	FR. 1 BHD.				1				
	VOID SPACE (P&S) (FR 10–AFT)	VOID	LONGL BHD.				2	2			
			TOTAL	23	29	18	13 65	4 16	4	1	1
			GRAND TOTAL	157							

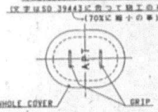
400×800 M.H.M.

LETTER ON MANHOLE

INDICATION OF NAMES TO BE PROVIDED ON ALL M.H.COVER

(文字はSD 39443に合って加工の事)

(70%に縮小の事)

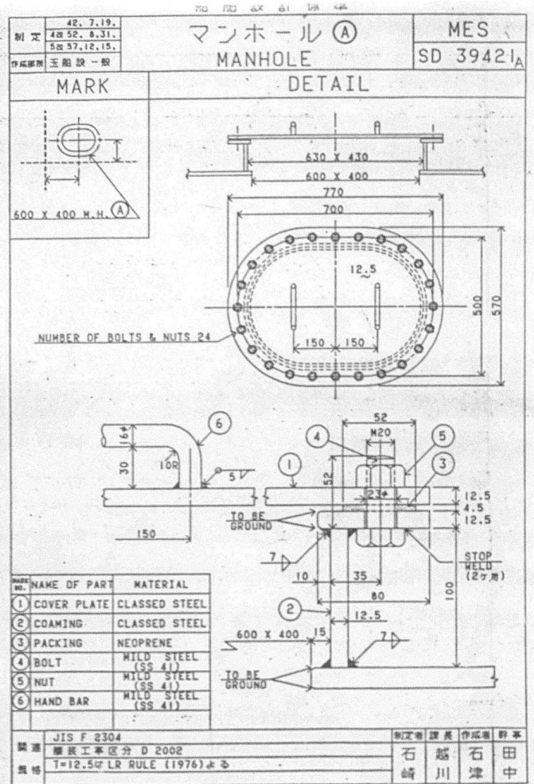


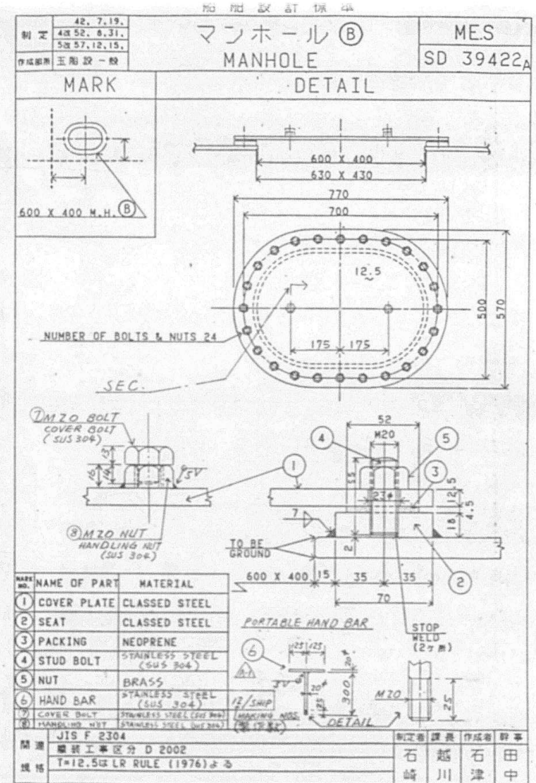
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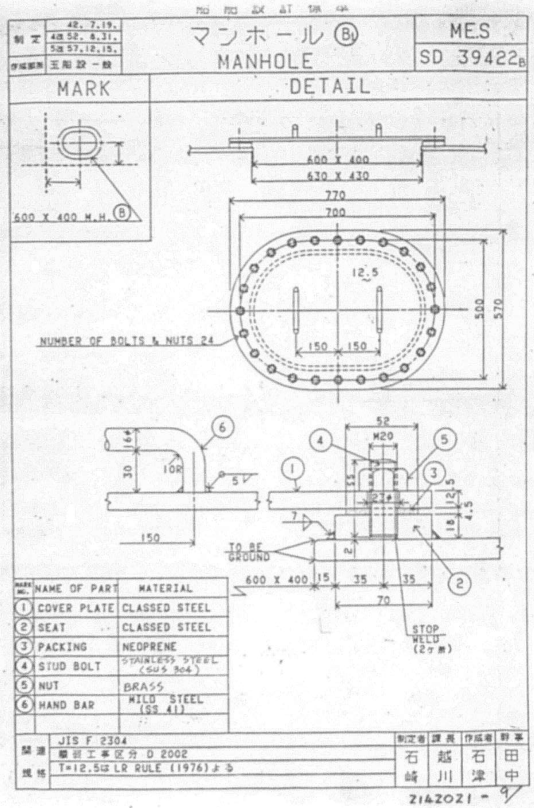


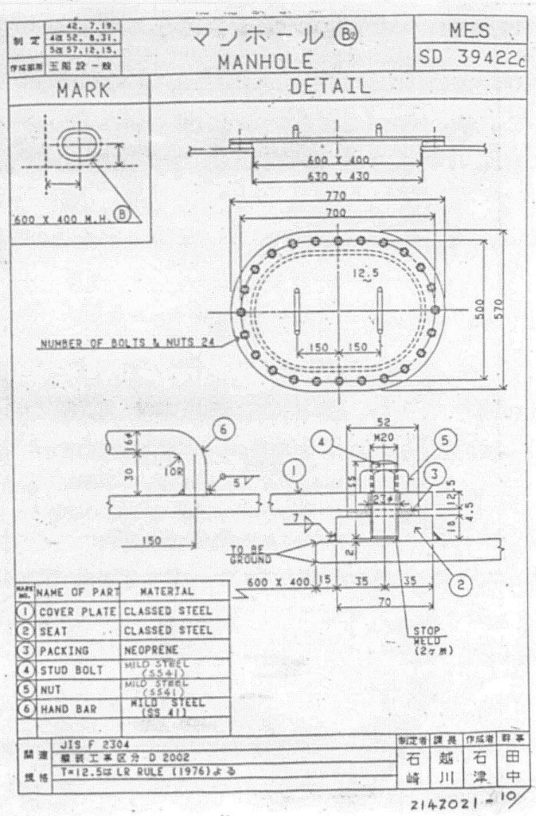
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4	30
5	20

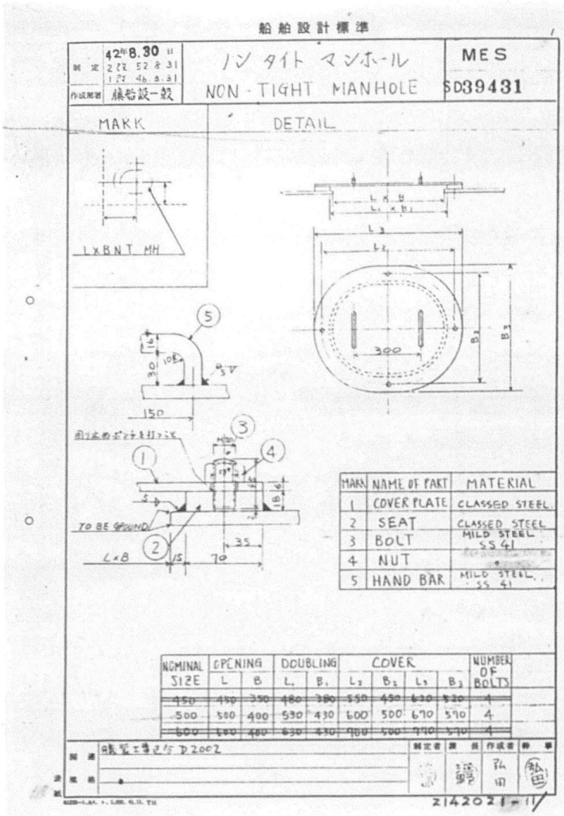
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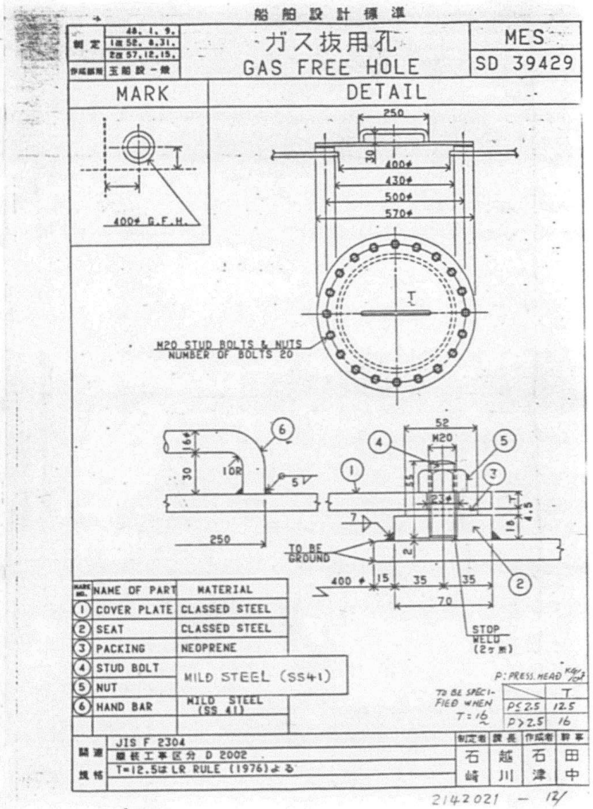

船 舶 設 計 標 準
制定 42. 7.19.
4回 52. 8.31.
5回 57.12.15.
作成部所 王船設一般
マンホール Ⓐ
MANHOLE
MES
SD 39421A
MARK
DETAIL
600 X 400 M.H. Ⓐ
630 X 430
600 X 400
770
700
500
570
12.5
150 150
NUMBER OF BOLTS & NUTS 24
52
M20
12.5
4.5
12.5
TO BE GROUND
STOP WELD (2ヶ所)
10R
5V
150
100
600 X 400
NAME OF PART | MATERIAL
1 COVER PLATE | CLASSED STEEL
2 COAMING | CLASSED STEEL
3 PACKING | NEOPRENE
4 BOLT | MILD STEEL (SS 41)
5 NUT | MILD STEEL (SS 41)
6 HAND BAR | MILD STEEL (SS 41)
関連規格 JIS F 2304
艤装工事区分 D 2002
T=12.5は LR RULE (1976)による
制定者 課長 作成者 幹事
石崎 越川 石津 田中
2142021-7

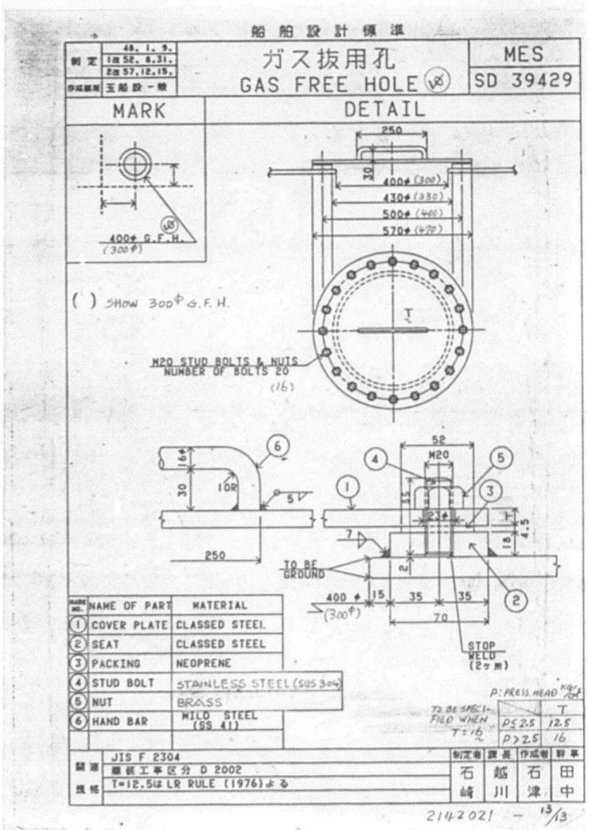

船 舶 設 計 標 準
制定 42. 7.19.
4回 52. 8.31.
5回 57.12.15.
作成部所 王船設一般
マンホール Ⓑ
MANHOLE
MES
SD 39422A
MARK
DETAIL
600 X 400 M.H. Ⓑ
600 X 400
630 X 430
770
700
500
570
12.5
175 175
NUMBER OF BOLTS & NUTS 24
SEC.
⑦M20 BOLT COVER BOLT (SUS 304)
⑧M20 NUT HANDLING NUT (SUS 304)
52
M20
TO BE GROUND
600 X 400
35 35
70
STOP WELD (2ヶ所)
PORTABLE HAND BAR
DETAIL
NAME OF PART | MATERIAL
1 COVER PLATE | CLASSED STEEL
2 SEAT | CLASSED STEEL
3 PACKING | NEOPRENE
4 STUD BOLT | STAINLESS STEEL (SUS 304)
5 NUT | BRASS
6 HAND BAR | STAINLESS STEEL (SUS 304)
7 COVER BOLT | STAINLESS STEEL (SUS 304)
8 HANDLING NUT | STAINLESS STEEL (SUS 304)
関連規格 JIS F 2304
艤装工事区分 D 2002
T=12.5は LR RULE (1976)による
制定者 課長 作成者 幹事
石崎 越川 石津 田中
2142021-8


船 舶 設 計 標 準
制定 42. 7.19.
4回 52. 8.31.
5回 57.12.15.
作成部所 王船設一般
マンホール Ⓑ1
MANHOLE
MES
SD 39422B
MARK
DETAIL
600 X 400 M.H. Ⓑ
600 X 400
630 X 430
770
700
500
570
12.5
150 150
NUMBER OF BOLTS & NUTS 24
52
M20
10R
5V
150
TO BE GROUND
600 X 400
35 35
70
STOP WELD (2ヶ所)
NAME OF PART | MATERIAL
1 COVER PLATE | CLASSED STEEL
2 SEAT | CLASSED STEEL
3 PACKING | NEOPRENE
4 STUD BOLT | STAINLESS STEEL (SUS 304)
5 NUT | BRASS
6 HAND BAR | MILD STEEL (SS 41)
関連規格 JIS F 2304
艤装工事区分 D 2002
T=12.5は LR RULE (1976)による
制定者 課長 作成者 幹事
石崎 越川 石津 田中
2142021-9


制定 42. 7.19.
4回 52. 8.31.
5回 57.12.15.
作成部所 王船設一般
マンホール Ⓑ2
MANHOLE
MES
SD 39422C
MARK
DETAIL
600 X 400 M.H. Ⓑ
600 X 400
630 X 430
770
700
500
570
12.5
150 150
NUMBER OF BOLTS & NUTS 24
52
M20
10R
5V
150
TO BE GROUND
600 X 400
35 35
70
STOP WELD (2ヶ所)
NAME OF PART | MATERIAL
1 COVER PLATE | CLASSED STEEL
2 SEAT | CLASSED STEEL
3 PACKING | NEOPRENE
4 STUD BOLT | MILD STEEL (SS41)
5 NUT | MILD STEEL (SS41)
6 HAND BAR | MILD STEEL (SS 41)
関連規格 JIS F 2304
艤装工事区分 D 2002
T=12.5は LR RULE (1976)による
制定者 課長 作成者 幹事
石崎 越川 石津 田中
2142021-10


船舶設計標準
ノンタイト マンホール
NON-TIGHT MANHOLE
MES
SD39431
MARK
DETAIL
L×B NT MH
MARK | NAME OF PART | MATERIAL
1 | COVER PLATE | CLASSED STEEL
2 | SEAT | CLASSED STEEL
3 | BOLT | MILD STEEL SS41
4 | NUT |
5 | HAND BAR | MILD STEEL SS41
NOMINAL SIZE | OPENING L | B | DOUBLING L1 | B1 | COVER L2 | B2 | L3 | B3 | NUMBER OF BOLTS
450 | 450 | 350 | 480 | 380 | 550 | 450 | 630 | 520 | 4
500 | 500 | 400 | 530 | 430 | 600 | 500 | 670 | 570 | 4
600 | 580 | 480 | 630 | 530 | 700 | 600 | 770 | 670 | 4
TO BE GROUND
2142021-11


船舶設計標準
ガス抜用孔
GAS FREE HOLE
MES
SD 39429
MARK
DETAIL
400φ G.F.H.
M20 STUD BOLTS & NUTS
NUMBER OF BOLTS 20
MARK | NAME OF PART | MATERIAL
1 | COVER PLATE | CLASSED STEEL
2 | SEAT | CLASSED STEEL
3 | PACKING | NEOPRENE
4 | STUD BOLT | MILD STEEL (SS41)
5 | NUT |
6 | HAND BAR | MILD STEEL (SS 41)
TO BE GROUND
STOP WELD (2ヶ所)
P: PRESS. HEAD
TO BE SPECIFIED WHEN T=16
P≦2.5 | 12.5
P>2.5 | 16
JIS F 2304
艤装工事区分 D 2002
T=12.5はLR RULE (1976)による
石崎 越川 石津 田中
2142021 - 12


船舶設計標準
ガス抜用孔
GAS FREE HOLE
MES
SD 39429
MARK
DETAIL
400φ G.F.H. (300φ)
( ) SHOW 300φ G.F.H.
400φ (300)
430φ (330)
500φ (400)
570φ (470)
M20 STUD BOLTS & NUTS
NUMBER OF BOLTS 20 (16)
MARK | NAME OF PART | MATERIAL
1 | COVER PLATE | CLASSED STEEL
2 | SEAT | CLASSED STEEL
3 | PACKING | NEOPRENE
4 | STUD BOLT | STAINLESS STEEL (SUS 304)
5 | NUT | BRASS
6 | HAND BAR | MILD STEEL (SS 41)
TO BE GROUND
STOP WELD (2ヶ所)
P: PRESS. HEAD
TO BE SPECIFIED WHEN T=16
P≦2.5 | 12.5
P>2.5 | 16
JIS F 2304
艤装工事区分 D 2002
T=12.5はLR RULE (1976)による
石崎 越川 石津 田中
2142021 - 13/13

ALT. NO.	OWNER DATE	OWNER LETTER NO.	USCG DATE	USCG LETTER NO.	ABS DATE	ABS LETTER NO.	USPH DATE	USPH LETTER NO.
ORIGINAL	—	TS1323/4/15 HFTS/MES-295			—	—		
A	21. JUNE 1985	TS1323/4/15 OFTS/MES-594			4. JULY 1985	REFER TO: TT/87 FILE REF: T-8-2		
A 1	7. AUG. 1985	TS1323/4/15 OFTS/MES824			17. SEP. 1985	REFER TO: TT/ FILE REF: T-8-2		
A 2	9. AUG 1985	TS1323/4/15 NO TAM/55			4. OCT. 1985	REFER TO: TT/ FILE REF: T-8-2		

FINISHEDPLAN

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SHIPYARD AND SHIP'S NO. & NAME			
MITSUI TAMANO		MITSUBISHI KOBE	
NO.1323	DOCTOR LYKES	NO.1158	JAMES LYKES
NO.1324	ALMERIA LYKES	NO.1159	JOSEPH LYKES
NO.1325	TILLIE LYKES	NO.1164	SOLON TURMAN

MITSUI ENGINEERING & SHIPBUILDING CO., LTD.
TAMANO WORKS

SHIP DESIGN DEPARTMENT — SHIP'S NO. **NO.1325** — SHIP'S NAME **TILLIE LYKES**

OUTFITTING DESIGN SECTION

小倉口蓋及び鋼製戸配置
ARR. OF SMALL HATCH & DOOR

DATE (TEL 2265)
JOB NO. TS1323/24/25 — SCALE 1/200 — LYKES REF. NO. 160204 — MITSUI DRAWING NO. 4120210

(#3 SHEETS WITH COVER)

(1/43)

B0-1
A1-1
A1-2
A4-71

PLAN RECORD

ALT. NO.	MARK	ALTERATION/DESCRIPTION	DATE & SIGNATURE
1		PREPARED FOR S.NO.1323 AS FINISHED PLAN, MADE APPLICABLE TO S.NO.1324 AND S.NO.1325.	NOVEMBER 20, 86

DWG. NO. 4120210 — 2

GENERAL NOTE

1. ASSUMED FREEBOARD DECK OF THIS SHIP, IS UNDER DECK PASSAGE LEVEL FOR THE DESIGN OF THESE EQUIPMENTS.
2. COAMING HEIGHT OF ROPE HATCH (H/R) ABOVE ST. GEAR ROOM IS ALTERED FROM 600 MM TO 450 MM BY THE REASON OF ABOVE ITEM 1
3. ACCESS HATCHES MARKED (HA/1) ~ (HA/5) AND ESCAPE HATCHES MARKED (HE/1) AND (HE/2) ARE CHANGED TO WATER TIGHT HATCH WITH 150 MM COAMING HT BY FOLLOWING REASON:
   (IF THESE HATCHES ARE WEATHER TIGHT TYPE, IT IS NECESSARY FOR THESE HATCHES TO HAVE 450 MM COAMING HT IN ACCORDANCE WITH ICLL. BUT IT IS IMPOSSIBLE TO KEEP 450 MM BECAUSE OF OBSTRUCTION OF STAGE BETWEEN HATCH COVERS)
4. ESCAPE HATCH FROM RADIO ROOM WAS DELETED, BECAUSE RADIO ROOM HAS TWO(2) DOORS WHICH ARE LED TO PASSAGE (DISS. MEMO - DATED FROM 16TH JAN. 1985 TO 23rd, 1985)
5. 1 METER HIGH PORTABLE CHAIN RAILING OR FIXED HAND RAIL ARE PROVIDED FOR ALL THE SMALL HATCHES. PLEASE SEE DWG NO 4120420 "ARR OF HAND RAIL AND LADDER" FOR YOUR REFERENCE, WHICH WILL BE SUBMITTED IN DUE COURSE.
6. HINGE TYPE OF EACH HATCH IS AS FOLLOWS: —
   - ACCESS HATCH (H/A), ROPE HATCH (H/R), ENGINE HATCH (H/E) ------- HINGES ONLY
   - ESCAPE HATCH (H/E) (H/S) ------- HINGES WITH SPRING
   - ACCESS HATCH (H/T) ------- HINGES WITH SPRING
   - STORE HATCH ------- HINGES WITH COUNTER WEIGHT
7. THE ENGINE HATCH MARKED (H/E) SHALL BE OPENED/CLOSED BY 7T ENGINE CRANE.

DWG. NO. 4120210 — 3

GENERAL NOTE

8. ~~VERTICAL LADDER IS NOT PROVIDED AT ROPE HATCH MARKED (H/R) BECAUSE THERE IS ANOTHER STAIRWAY PASSING DOWN TO ST. GEAR ROOM NEAR THIS HATCH,~~ ALL HATCHES. (SEE OTHE PLAN) (OWNER'S COMMENTS ON DWG. 4120210)
9. PRESSURE TEST FOR WATERTIGHT DOOR (W/T) AND WATERTIGHT HATCH (H/T) SHALL BE CARRIED OUT WITH DESIGN PRESSURE AT MANUFACTURER'S SHOP, BUT NOT ON BOARD.
   AND, PRESSURE TEST FOR WATERTIGHT HATCH (H/T) & (H/A) SHALL NOT BE CARRIED OUT, BECAUSE THE POSITION OF THESES DOORS IS OUT OF FLOODING SPACE.
10. CAUTION PLATES ARE FITTED ON DOORS OR HATCHES MARKED (W/T), (H/T), (H/A) AND (H/E) AS SHOWN.
11. OPENING INDICATION LAMP ARE FITTED AT THE CENTRAL STATION FOR WATERTIGHT DOOR (W/T) AND HATCH (H/T) RESPECTIVELY.
12. HOSE OR CHALK TEST FOR HACHS (H/R), (H/E), (H/S), (H/A) AND DOORS (W/S), (W/C), (W/D), (W/T) SHALL BE CARRIED OUT ON BOARD. (OWNER'S COMMENTS ON DWG 4120210)
13. HOLD OPEN HOOKS AND STOPPERS TO BE FITTED FOR ALL DOORS.
14. (H/S), (H/T), (H/A) AND (H/E) MARKED HATCH COVERS ARE TO BE HOSE-TESTED UNDER PRESSURE OF AT LEAST 2.1 kg/cm². (ABS COMMENTS ON DWG 4120210A)

DWG. NO. 4120210 — 4

760

REFERENCE			
NO.	REF. NO	DWG NO	DWG NAME
1		1102022A	WATERTIGHT COMPARTMENTATION
2		1102038	WATER LINES AFTER DAMAGED
3		4111001C 4111008C	ACCOMMODATION PLAN (1/2) ~ (8/6)
4		4109101	CONSTRUCTION OF FIRE PROTECTION ARR. OF
5		4111035	ACCOMM. DOOR & WINDOW
6		5151001A	ARRANG. OF ENG. ROOM & EMERG. GEN. ROOM INCLUDING FLOORING & VENT. AIR DUCTING
7		4120001A	ESCAPE ROUTE

DWG. № 4120210 5

SMALL HATCH

社内注!(WORKING NOTE!)

1. 切り開けは 船殻図に依る
   DECK OPENING : SHOWN IN HULL CONSTRUCTION DRAWING
2. 小倉口蓋用注文書は下記に依る
   ORDER SHEET OF SMALL HATCH COVER
   - 小倉口蓋詳細 DETAIL OF SMALL HATCH — DWG. NO. 4120212
   - 鋼製戸及小倉口蓋 STEEL DOOR & SMALL HATCH — T/# 4220210
   - 小倉口蓋銘板(鋼製戸及び小倉口蓋銘板注文) NAME PLATE OF SMALL HATCH COVER — DWG. NO. 4220210
3. TYPE OF LOCK (A2)
   MARK TYPE OF LOCK
   P - - - - - - - PAD LOCK

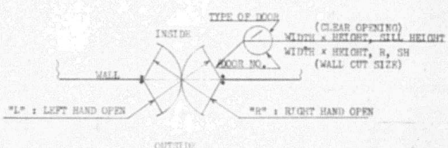
小倉口蓋要目
LIST OF SMALL HATCH COVER

形式 TYPE	符号 MARK	甲板切開 DECK OPEN	取付位置 FITTING POSITION 区画 SPACE	甲板 DECK	フレーム FR. NO.	舷 SIDE	(H) コーミング高 COAM. HEIGHT	錠 WITH LOCK	製作図 MANUFACT. DRAWING	記事 REMARKS
H/T	1	750×600	DUCT KEEL	FLOOR PL LEVEL	82½	P	150	—		WATERTIGHT ACCESS HATCH (A2)
H/A	1	600×600	NO.1 HOLD	UPP DK	250	P	250	P		WATERTIGHT ACCESS HATCH
	2	600×600	NO.2 HOLD	↓	214	↓	↓	P		〃
	3	600×600	NO.3 HOLD	↓	178	↓	↓	P		〃 (A4)
	4	600×600	NO.4 HOLD	↓	142	↓	↓	P		〃
	5	600×600	NO.6 HOLD	↓	30	↓	↓	P		〃
H/E	1	~~600~~ 750×600	DUCT KEEL	UPP DK	195	S	150	—		WATERTIGHT ESCAPE HATCH (A2)
	2	600×600	SHAFT TUNNEL	↓	30	↓	150	—		〃
H/S	1	600×600	CO2 BOTTLE RM.	UPP DK	288	S	150	—		WEATHERTIGHT ESCAPE HATCH
										〃 (A3)
	3	600×600	ELEVATOR TRUNK	HOUSE TOP (D7)	276½	〃	150	—		WEATHER TIGHT ESCAPE HATCH
H/W	1	1200×1600	BOATSN'S STORE	SALOON DECK	301	S	600	P		WEATHERTIGHT ROPE HATCH (A)
	2	600φ	STEERING GEAR ROOM	UPP DK	-2½	P	450	P		〃 (A2)
	3	3170×2000	ENGINE RM.	5.2M LEVEL	54	S	600	P		WEATHERTIGHT HATCH (A3)
	4	300φ	BOATSN'S STORE	FCL DK	310½	P	450	—		WATER TIGHT ROPE HATCH

DWG № 4120210 6

REMARKS FOR DOOR

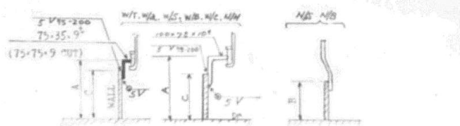
1. EXPLANATION OF MARKS AND DIMENSIONS :



2. TYPE OF LOCK

MARK	TYPE OF LOCK
P	PAD LOCK (CYLINDER TYPE)
PK	PAD LOCK WITH ESCAPE LATCH
R	RIM LOCK
RS	RIM LOCK WITH THUMTURN
RL	RIM LATCH
C	DOOR CHECK (SELF CLOSING DEVICE)

3. THE CENTRE OF DOOR OPENING TO BE ACCORDED WITH THE CENTRE BETWEEN STIFFENERS EXCEPT SPECIFIED.
   (ドア取付壁の切開け中心は特記の他はスティフナー間の中心とする。切り開け寸法はスケッチ図による。)
4. COAMING AND SILL



A : REQUIRED SILL HEIGHT
B : REQUIRED SILL HEIGHT & WALL CUT
C : WALL CUT

DWG № 4120210 7

鋼製戸要目
LIST OF STEEL DOOR (製品図は各1枚 / 区分を要す)

形式 TYPE	戸番号 NO.	出入口寸法 CLEAR OPEN	SILL HEIGHT	開き方 WAY OF OPEN	戸錠 TYPE OF LOCK	窓 VISOR	ステップ STEP	取付位置 FITTING POSITION 室名 ROOM NAME	甲板 DECK	フレーム FR. NO.	舷 SIDE	INFORMATION FOR SHIPYARD ブロック名	注文納期		取付ステージ	記事 REMARKS
W/T	1	700×1750	200	L	—	—	—	ENTRANCE	2ND DK	268	S	FUD1			小組立	
	2	700×1750	200	R	—	—	—	↓	↓	268	P	FUD1				
	3	700×1750	200	R	—	—	—	PASSAGE WAY	UNDER UP PASSAGE	84	S	ALB1B				C
	4	700×1750	200	L	—	—	—			84	P	ALB1B				C
	5	700×1750	200	L	—	—	—			50	S	ATB3A				C
	6	700×1750	200	R	—	—	—	↓		50	P	ATB3A				C
	7	700×1750	200	L	—	—	—	STEERING GEAR ROOM		12	S	AP3W				
	8	700×1750	200	R	—	—	—	↓	↓	12	P	AP3W			↓	
W/A	1	600×900	600	L	—	—	—	CHAIN LKR.	UPP DK	290	P	FC2			小組立	
	2	600×900	600	R	—	—	—	↓	↓	290	S	FC2			↓	
W/S	1	900×1570	380	L	PK	—	—	HOSPITAL	SALOON DECK	281	P	CRW1W			小組立	
	2	700×1570	380	L (A)	P	O	—	CO2 BOTTLE RECESS	UPP DK	51½	S	CA1S			↓	

DWG № 4120210 8

761

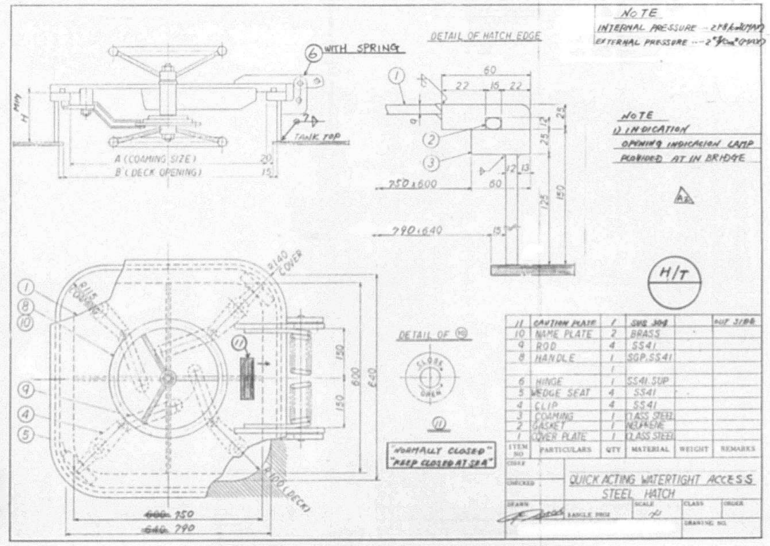
NOTE
DIMENSION IN ( ) TO BE SHOWN FROM THE TOP OF FLOOR.

鋼製戸要目
LIST OF STEEL DOOR (製品図は各1枚 / 区分を要す)

形式 TYPE	戸番号 NO.	出入口寸法 CLEAR OPEN	SILL HEIGHT	開閉勝手 WAY OF OPEN	戸締 TYPE OF LOCK	庇 VISOR	ステップ STEP	取付位置 FITTING POSITION 室名 ROOM NAME	甲板 DECK	フレーム FR.NO.	舷 SIDE	INFORMATION FOR SHIPYARD ブロック名	注文納期		取付ステージ	記事 REMARKS
W/C	1			MISSING	NUMBER											
	2	700×1570	380	R	P	—	—	BOATSN'S STORE	UPP DK	287	P	FC/W			[illegible]	WITH DOOR CHECK
	3	700×1750	200	L	P	○	—	BATT. RM.	NAV BRIDGE DK	273½	P	CO				
	4	600×1750	1400 (200)	L	PK	○		NO5 HOLD	UPP DK	105½	P	DH2				
	5	600×1570	380	R	PK	○		NO.5 HOLD	↓	84½	P	DH1				
	6	700×1570	380	R	PK	○	—	ESCAPE TRUNK FOR ENG. CONTROL RM		56	S	CA1S				
	7	700×1570	380	R	P	○	—	PAINT RM.		54	S	CA1S				
	8	700×1570	380	R	PK	○	—	ENGINE CONFERENCE RM.		50	S	CA1S				
	9	700×1570	380	L	PK	○	—	ENG. CASING OF ENT.		50	S	CA1S				
	10	700×1570	380	L	PK	○	—	↓		55½	P	CA1P				
	11	700×1570	380	L	PK	○	—	STEERING GER RM	↓	8	P	A0H1				
	12	600×1750	200	R	PK	○	—	ENGINE ROOM	5.2M LEVEL	56½	S	CA1S				WITH DOOR CHECK
	13	700×1750	200	L	P	○	—	DECK CHAIR	NAV. BRDK	274½	S	CO				
	14	700×1750	200	R	PK	○	—	EMER. GEN. RM.	2.6M LEVEL	54	S	CA1S			↓	
N/H	1	700×1750	200	R	—	○	—	——	SALOON DECK	282½	S	CRW1W			[illegible]	
	2	700×1750	200	L	—	○	—	——	↓	↓	P	CRW1W			↓	

DWG NO 9120210

10



DWG NO 9120210

12

鋼製戸要目
LIST OF STEEL DOOR (製品図は各1枚 / 区分を要す)

形式 TYPE	戸番号 NO.	出入口寸法 CLEAR OPEN	SILL HEIGHT	開閉勝手 WAY OF OPEN	戸締 TYPE OF LOCK	庇 VISOR	ステップ STEP	取付位置 FITTING POSITION 室名 ROOM NAME	甲板 DECK	フレーム FR.NO.	舷 SIDE	INFORMATION FOR SHIPYARD ブロック名	注文納期		取付ステージ	記事 REMARKS
W/B	1	700×1570	380	R	P	—	—	WATCH MAN'S ST	UPP DK	268	S	FC1W			[illegible]	
	2	1070×1600	600	R	PK	—	BOTH SIDE	HANDLING SPACE		269½	S	FC1W				
	3	700×1570	380	R	P	—	—	OIL SKIN LKR		268	S	FC1W				
	4	700×1600	600	R	PK	—	BOTH SIDE	ENTRANCE		269½	S	FC1C				INNER SIDE OF WOODEN STEP
	5	700×1600	600	L	PK	—		↓		269½	P	FC1C				〃
	6	700×1600	600	L	PK	—	↓	SUEZ CANAL CREW CONF. RM.		268	P	FC1W				INNER SIDE OF WOODEN STEP
	7	700×1570	380	L	P	—	—	DECK STORE	↓	268	P	FC1W				
	8	700×1570	380	R	PK	—	—	ENTRANCE	SALOON DECK	278	S	CRW1W				
	9	700×1570	380	L	PK	—	—	↓	↓	278	P	CRW1W			↓	

DWG NO 9120210

9

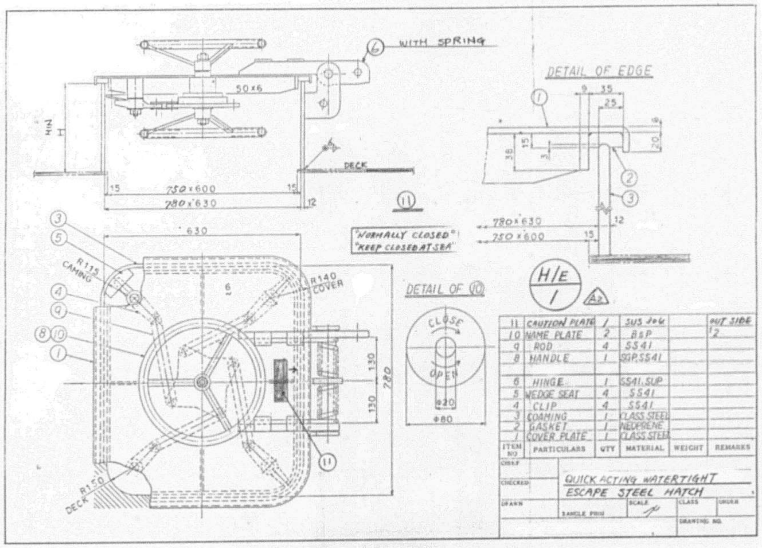
鋼製戸要目
LIST OF STEEL DOOR (製品図は各1枚 / 区分を要す)

形式 TYPE	戸番号 NO.	出入口寸法 CLEAR OPEN	SILL HEIGHT	開閉勝手 WAY OF OPEN	戸締 TYPE OF LOCK	庇 VISOR	ステップ STEP	取付位置 FITTING POSITION 室名 ROOM NAME	甲板 DECK	フレーム FR.NO.	舷 SIDE	INFORMATION FOR SHIPYARD ブロック名	注文納期		取付ステージ	記事 REMARKS
N/S	1	600×700	200	L	—	—	—	——	NAV BRIDGE DK	285½	S	CO			船台	
	2	600×700	200	R	—	—	—	——	〃	285½	P	CO			↓	
N/B	1	700×1750	200	R	RS	—	—	FWD MACH. SPACE	2ND DECK	280	S	FUD2			船台	

DWG NO 9120210

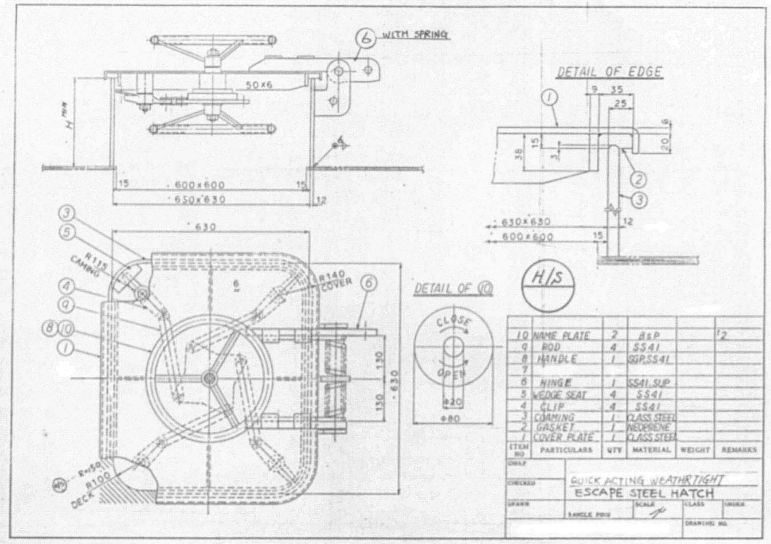
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762



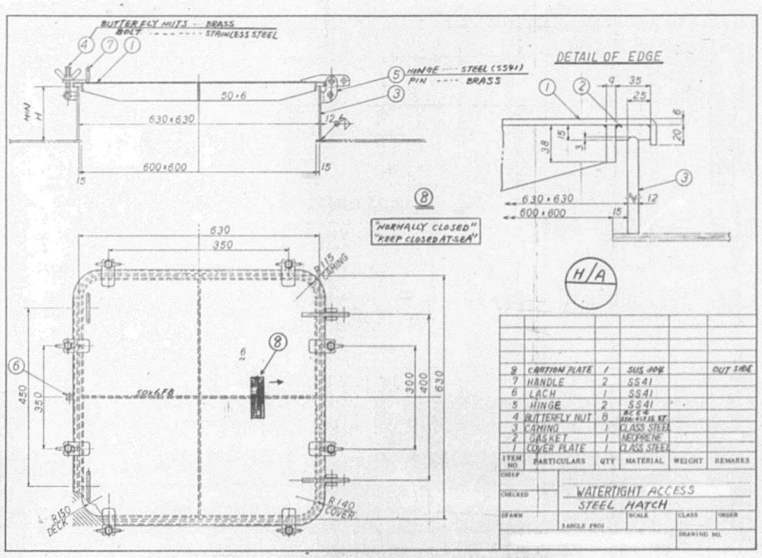
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14



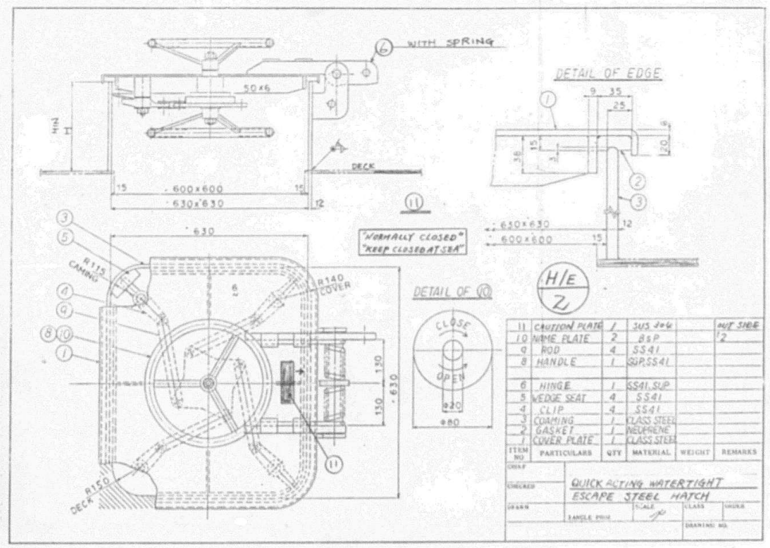
DRG NO 412021O

16



DRG NO 412021O

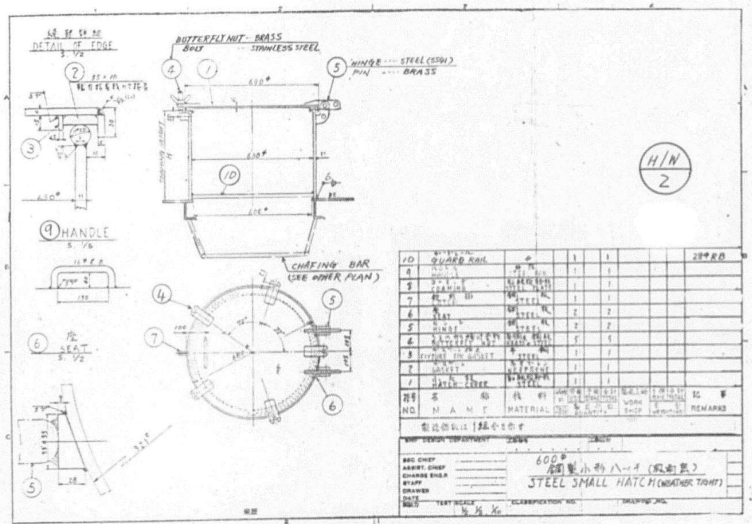
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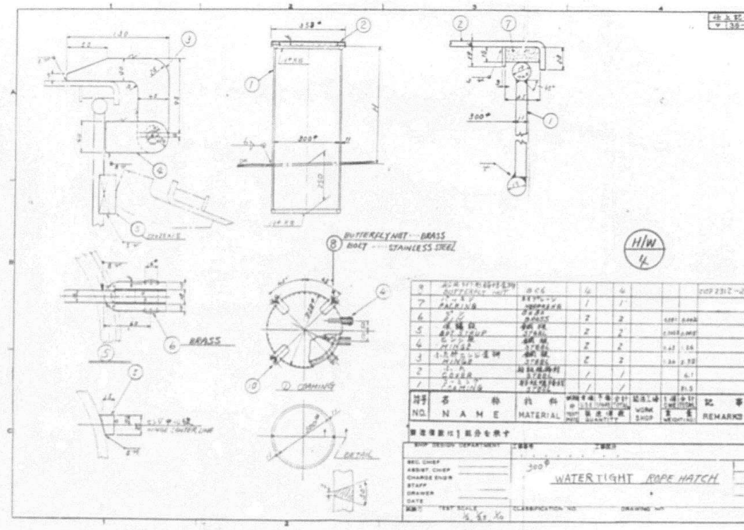


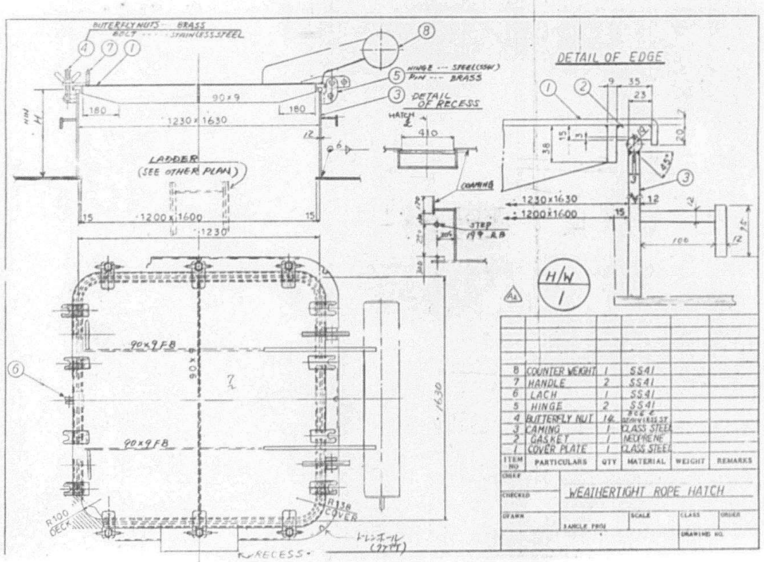
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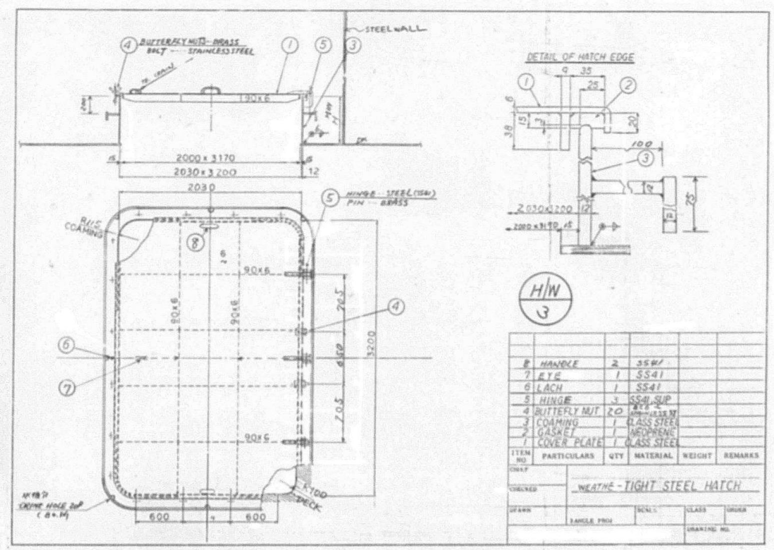
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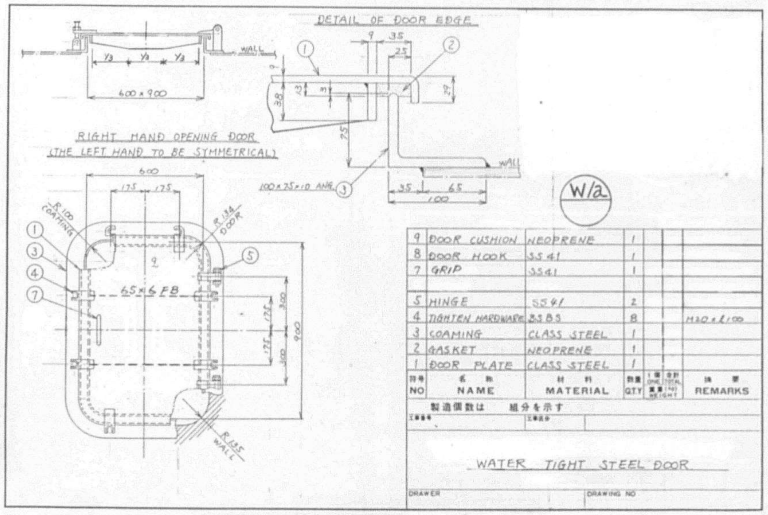

DETAIL OF EDGE
BUTTERFLY NUT … BRASS
BOLT … STAINLESS STEEL
HINGE … STEEL (SS41)
PIN … BRASS
HANDLE
SEAT
CHAFING BAR
(SEE OTHER PLAN)
H/W 2
600φ
鋼製小形ハッチ(風密型)
STEEL SMALL HATCH (WEATHER TIGHT)


BUTTERFLY NUT … BRASS
BOLT … STAINLESS STEEL
BRASS
H/W 4
300φ
WATERTIGHT ROPE HATCH


BUTTERFLY NUTS … BRASS
BOLT … STAINLESS STEEL
HINGE … STEEL (SS41)
PIN … BRASS
DETAIL OF RECESS
DETAIL OF EDGE
1230×1630
1200×1600
LADDER
(SEE OTHER PLAN)
90×9 FB
H/W 1
8 COUNTER WEIGHT 1 SS41
7 HANDLE 2 SS41
6 LACH 1 SS41
5 HINGE 2 SS41
4 BUTTERFLY NUT 14
3 CAMING 1 CLASS STEEL
2 GASKET 1 NEOPRENE
1 COVER PLATE 1 CLASS STEEL
ITEM NO PARTICULARS QTY MATERIAL WEIGHT REMARKS
WEATHERTIGHT ROPE HATCH
RECESS


BUTTERFLY NUTS … BRASS
BOLT … STAINLESS STEEL
STEEL WALL
DETAIL OF HATCH EDGE
2000×3170
2030×3200
HINGE … STEEL (SS41)
PIN … BRASS
COAMING
90×6
H/W 3
8 HANDLE 2 SS41
7 EYE 1 SS41
6 LACH 1 SS41
5 HINGE 3 SS41
4 BUTTEFLY NUT 20
3 COAMING 1 CLASS STEEL
2 GASKET 1 NEOPRENE
1 COVER PLATE 1 CLASS STEEL
ITEM NO PARTICULARS QTY MATERIAL WEIGHT REMARKS
WEATHE-TIGHT STEEL HATCH
DECK

764

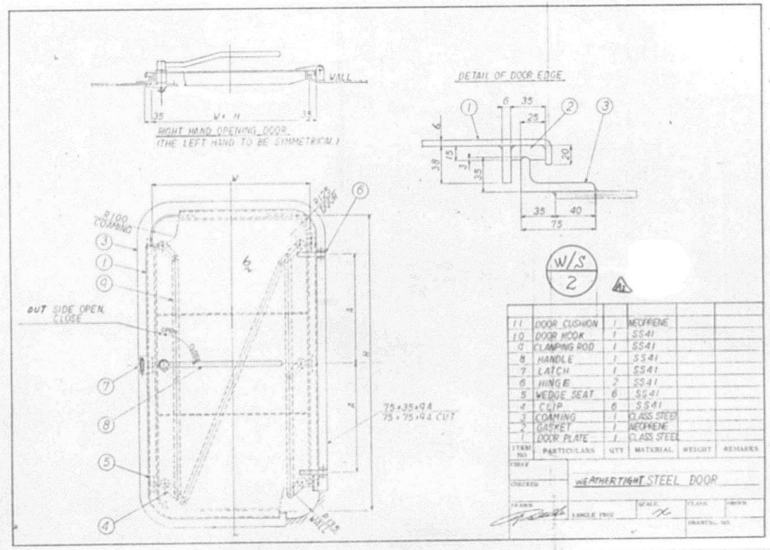


NO	NAME	MATERIAL	QTY	ONE WEIGHT	TOTAL WEIGHT	REMARKS
9	DOOR CUSHION	NEOPRENE	1			
8	DOOR HOOK	SS41	1			
7	GRIP	SS41	1			
5	HINGE	SS41	2			
4	TIGHTEN HARDWARE	BSBS	8			M20 × ℓ100
3	COAMING	CLASS STEEL	1			
2	GASKET	NEOPRENE	1			
1	DOOR PLATE	CLASS STEEL	1			

製造個数は　組分を示す

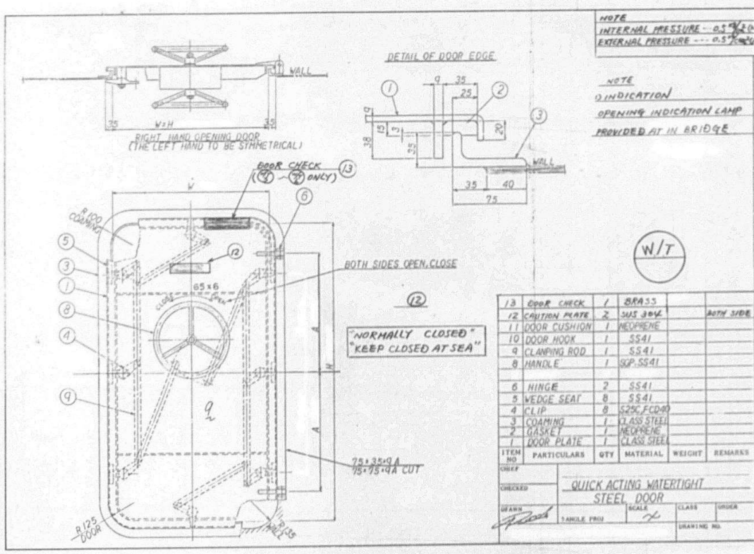
WATER TIGHT STEEL DOOR

DRAWER　DRAWING NO



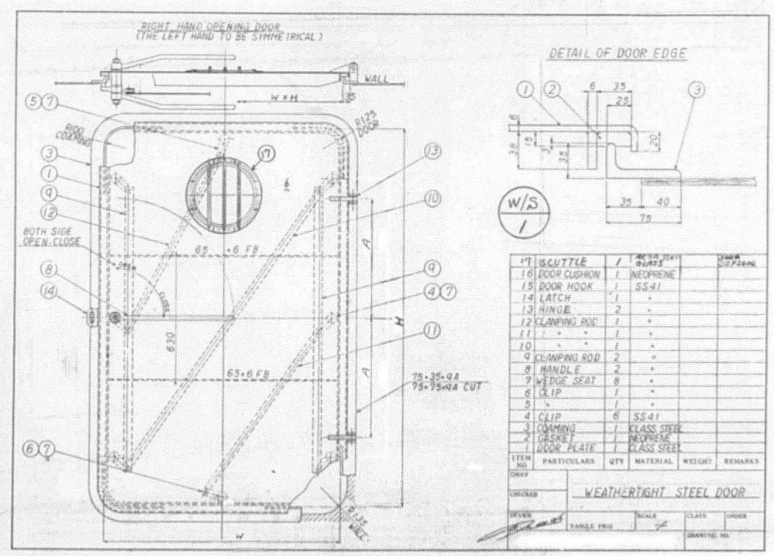
ITEM NO	PARTICULARS	QTY	MATERIAL	WEIGHT	REMARKS
11	DOOR CUSHION	1	NEOPRENE		
10	DOOR HOOK	1	SS41		
9	CLAMPING ROD	1	SS41		
8	HANDLE	1	SS41		
7	LATCH	1	SS41		
6	HINGE	2	SS41		
5	WEDGE SEAT	6	SS41		
4	CLIP	6	SS41		
3	COAMING	1	CLASS STEEL		
2	GASKET	1	NEOPRENE		
1	DOOR PLATE	1	CLASS STEEL		

WEATHERTIGHT STEEL DOOR



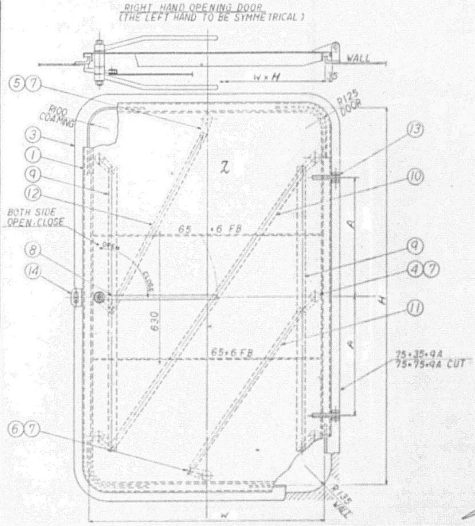
ITEM NO	PARTICULARS	QTY	MATERIAL	WEIGHT	REMARKS
13	DOOR CHECK	1	BRASS		
12	CAUTION PLATE	2	SUS 304		BOTH SIDE
11	DOOR CUSHION	1	NEOPRENE		
10	DOOR HOOK	1	SS41		
9	CLAMPING ROD	1	SS41		
8	HANDLE	1	SGP, SS41		
6	HINGE	2	SS41		
5	WEDGE SEAT	8	SS41		
4	CLIP	8	S25C, FCD40		
3	COAMING	1	CLASS STEEL		
2	GASKET	1	NEOPRENE		
1	DOOR PLATE	1	CLASS STEEL		

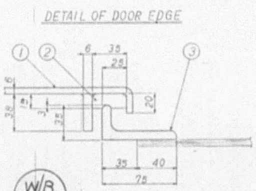
QUICK ACTING WATERTIGHT STEEL DOOR



ITEM NO	PARTICULARS	QTY	MATERIAL	WEIGHT	REMARKS
17	SCUTTLE	1	[illegible] GLASS		[illegible]
16	DOOR CUSHION	1	NEOPRENE		
15	DOOR HOOK	1	SS41		
14	LATCH	1	"		
13	HINGE	2	"		
12	CLAMPING ROD	1	"		
11	" "	1	"		
10	" "	1	"		
9	CLAMPING ROD	2	"		
8	HANDLE	2	"		
7	WEDGE SEAT	8	"		
6	CLIP	1	"		
5	"	1	"		
4	CLIP	6	SS41		
3	COAMING	1	CLASS STEEL		
2	GASKET	1	NEOPRENE		
1	DOOR PLATE	1	CLASS STEEL		

WEATHERTIGHT STEEL DOOR



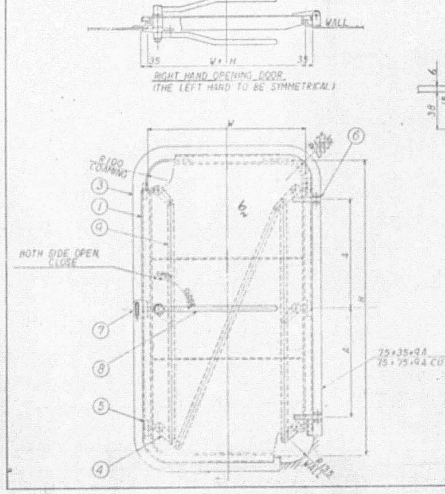


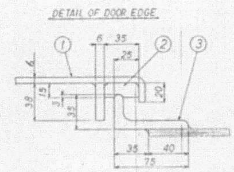
W/B 2

ITEM NO	PARTICULARS	QTY	MATERIAL	WEIGHT	REMARKS
16	DOOR CUSHION	1	NEOPRENE		
15	DOOR HOOK	1	SS41		
14	LATCH	1	"		
13	HINGE	2	"		
12	CLANPING ROD	1	"		
11	" "	1	"		
10	" "	1	"		
9	CLANPING ROD	2	"		
8	HANDLE	2	"		
7	WEDGE SEAT	8	"		
6	CLIP	1	"		
5	"	1	"		
4	CLIP	6	SS41		
3	COAMING	1	CLASS STEEL		
2	GASKET	1	NEOPRENE		
1	DOOR PLATE	1	CLASS STEEL		

WEATHERTIGHT STEEL DOOR

DWG NO 4120210 26



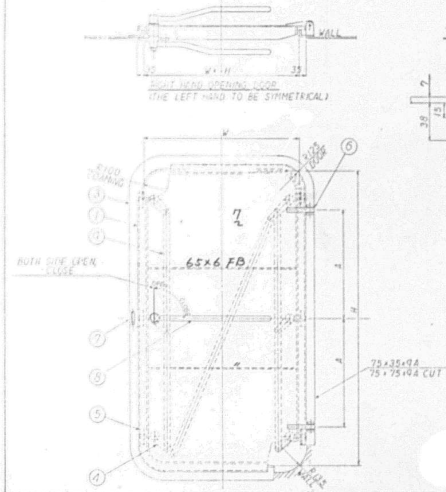


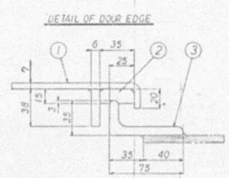
W/C 14, W/C 3 ~ W/C 11, W/C 13

ITEM NO	PARTICULARS	QTY	MATERIAL	WEIGHT	REMARKS
11	DOOR CUSHION	1	NEOPRENE		
10	DOOR HOOK	1	SS41		
9	CLANPING ROD	1	SS41		
8	HANDLE	1	SS41		
7	LATCH	1	SS41		
6	HINGE	2	SS41		
5	WEDGE SEAT	6	SS41		
4	CLIP	6	SS41		
3	COAMING	1	CLASS STEEL		
2	GASKET	1	NEOPRENE		
1	DOOR PLATE	1	CLASS STEEL		

WEATHERTIGHT STEEL DOOR

DWG NO 4120210 28



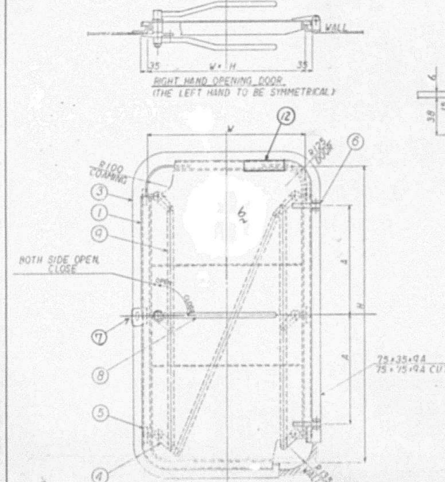


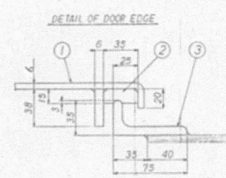
W/B 1, W/B 3 ~ W/B 9

ITEM NO	PARTICULARS	QTY	MATERIAL	WEIGHT	REMARKS
11	DOOR CUSHION	1	NEOPRENE		
10	DOOR HOOK	1	SS41		
9	CLANPING ROD	1	SS41		
8	HANDLE	1	SS41		
7	LATCH	1	SS41		
6	HINGE	2	SS41		
5	WEDGE SEAT	6	SS41		
4	CLIP	6	SS41		
3	COAMING	1	CLASS STEEL		
2	GASKET	1	SILICON		
1	DOOR PLATE	1	CLASS STEEL		

WEATHERTIGHT STEEL DOOR

DWG NO 4120210 25





W/C 2, W/C 12

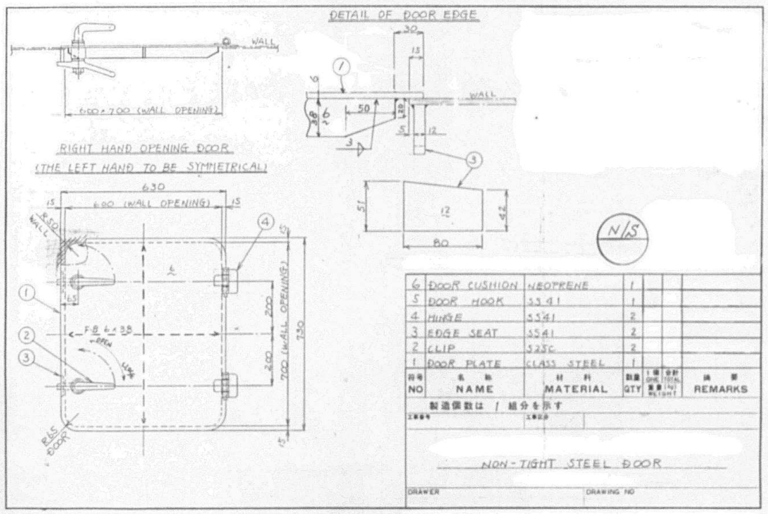
ITEM NO	PARTICULARS	QTY	MATERIAL	WEIGHT	REMARKS
12	DOOR CHECK	1	BRASS		
11	DOOR CUSHION	1	NEOPRENE		
10	DOOR HOOK	1	SS41		
9	CLAMPING ROD	1	SS41		
8	HANDLE	1	SS41		
7	LATCH	1	SS41		
6	HINGE	2	SS41		
5	WEDGE SEAT	6	SS41		
4	CLIP	6	SS41		
3	COAMING	1	CLASS STEEL		
2	GASKET	1	NEOPRENE		
1	DOOR PLATE	1	CLASS STEEL		

WEATHERTIGHT STEEL DOOR

DWG NO 4120210 27

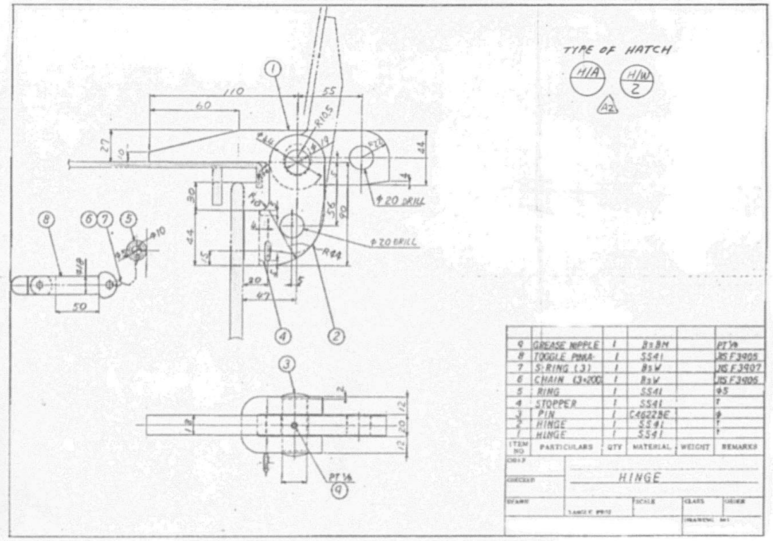
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30



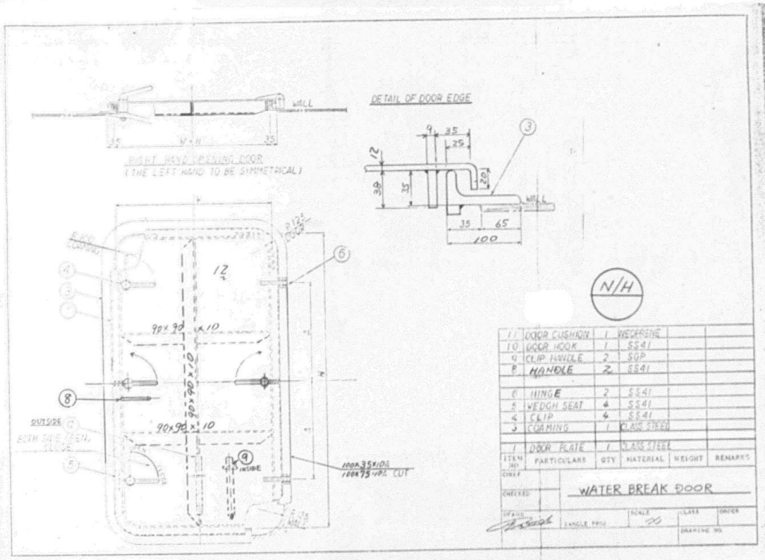
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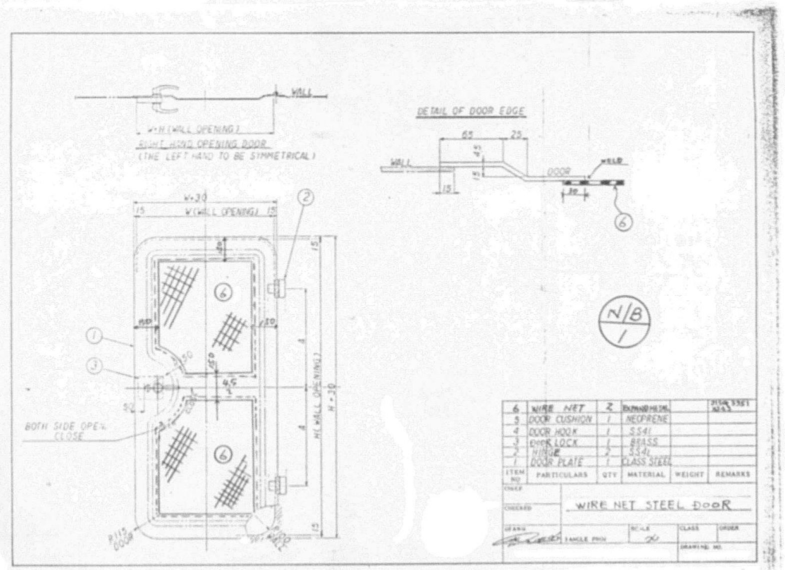
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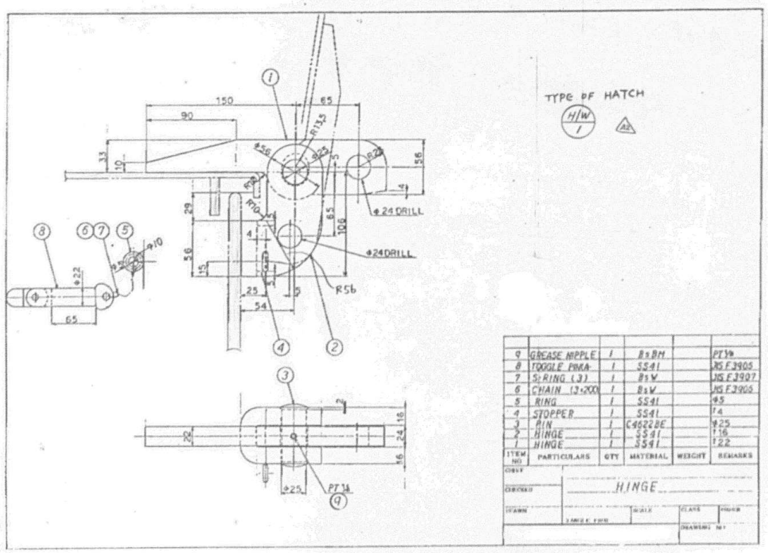


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31



767

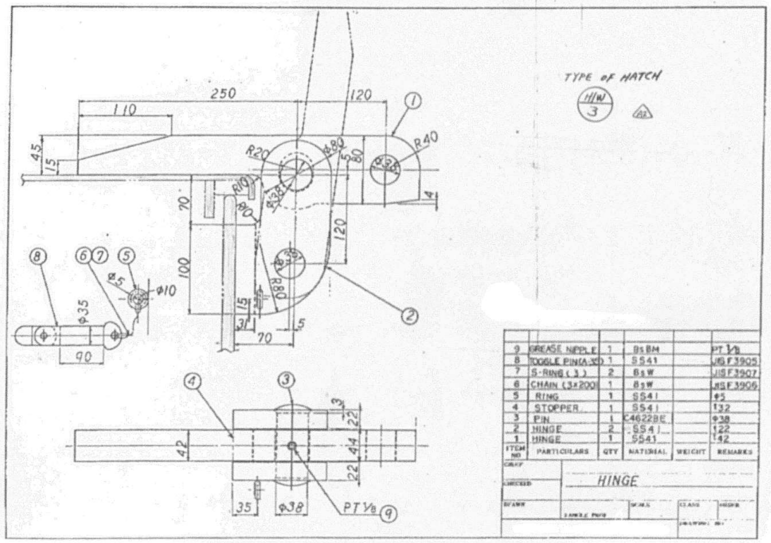


ITEM NO	PARTICULARS	QTY	MATERIAL	WEIGHT	REMARKS
9	GREASE NIPPLE	1	BsBM		PT 1/8
8	TOGGLE PIN(A-	1	SS41		JIS F3905
7	S-RING (3)	1	BsW		JIS F3907
6	CHAIN (3×200)	1	BsW		JIS F3905
5	RING	1	SS41		φ5
4	STOPPER	1	SS41		t4
3	PIN	1	C4622BE		φ25
2	HINGE	1	SS41		t16
1	HINGE	1	SS41		t22

HINGE

DWG NO 4120210

33

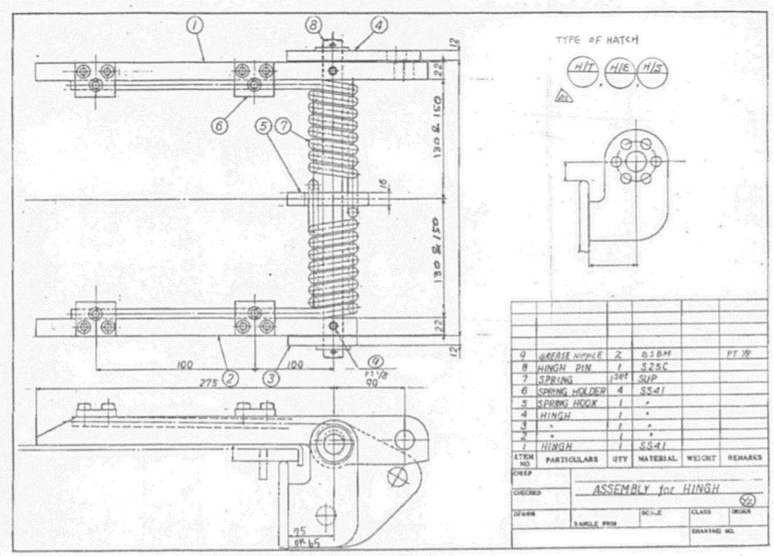


ITEM NO	PARTICULARS	QTY	MATERIAL	WEIGHT	REMARKS
9	GREASE NIPPLE	1	BsBM		PT 1/8
8	TOGGLE PIN(A-30)	1	SS41		JIS F3905
7	S-RING (3)	2	BsW		JIS F3907
6	CHAIN (3×200)	1	BsW		JIS F3906
5	RING	1	SS41		φ5
4	STOPPER	1	SS41		t32
3	PIN	1	C4622BE		φ38
2	HINGE	2	SS41		t22
1	HINGE	1	SS41		t42

HINGE

DWG NO 4120210

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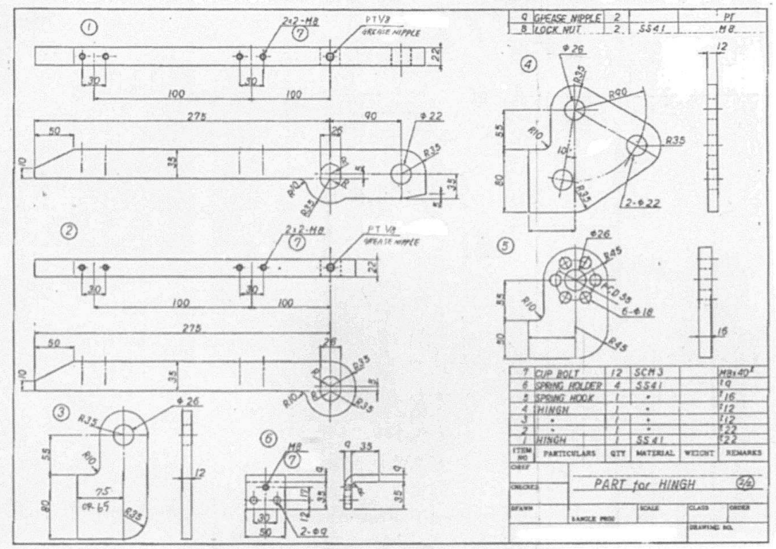


ITEM NO	PARTICULARS	QTY	MATERIAL	WEIGHT	REMARKS
9	GREASE NIPPLE	2	BsBM		PT 1/8
8	HINGH PIN	1	S25C		
7	SPRING	1 SET	SUP		
6	SPRING HOLDER	4	SS41		
5	SPRING HOOK	1	"		
4	HINGH	1	"		
3	"	1	"		
2	"	1	"		
1	HINGH	1	SS41		

ASSEMBLY for HINGH

DWG NO 4120210

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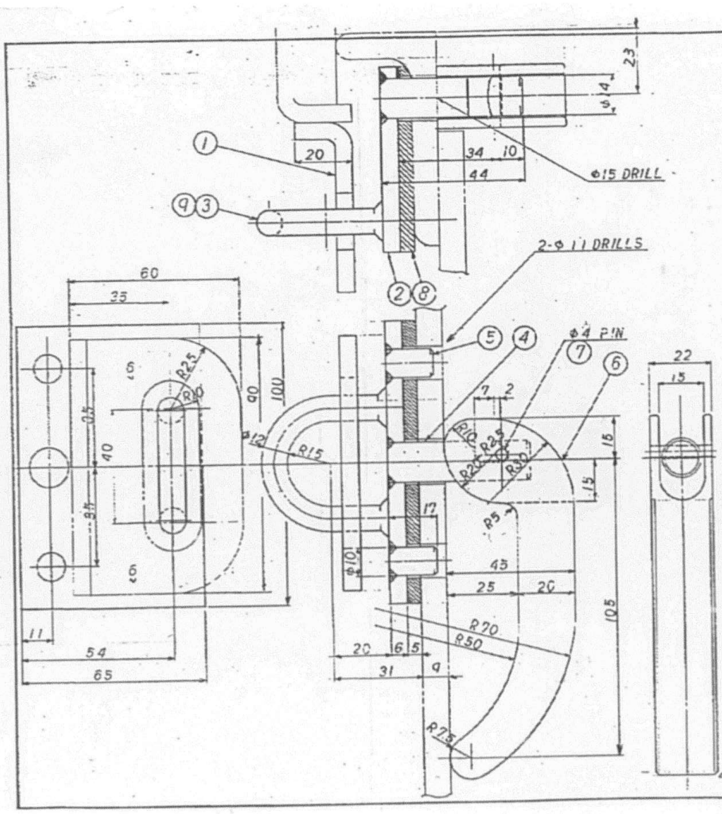
ITEM NO	PARTICULARS	QTY	MATERIAL	WEIGHT	REMARKS
9	GREASE NIPPLE	2			PT
8	LOCK NUT	2	SS41		M8
7	CUP BOLT	12	SCM3		M8×40
6	SPRING HOLDER	4	SS41		t9
5	SPRING HOOK	1	"		t16
4	HINGH	1	"		t12
3	"	1	"		t12
2	"	1	"		t22
1	HINGH	1	SS41		t22

PART for HINGH

DWG NO 4120210

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ITEM NO	PARTICULARS	QTY	MATERIAL	WEIGHT	REMARKS
9	PAD LOCK	1	Brass		
8	PACKING	1	NEOPRENE		t5
7	PIN	1	S45C		φ4
6	HANDLE	1	SS41		t22
5	PIN	2	"		φ10
4	PIN	1	"		φ14
3	EYE RING	1	"		φ12
2	BASE PLATE	1	"		t6
1	EYE PLATE	1	SS41		t6

CHIEF

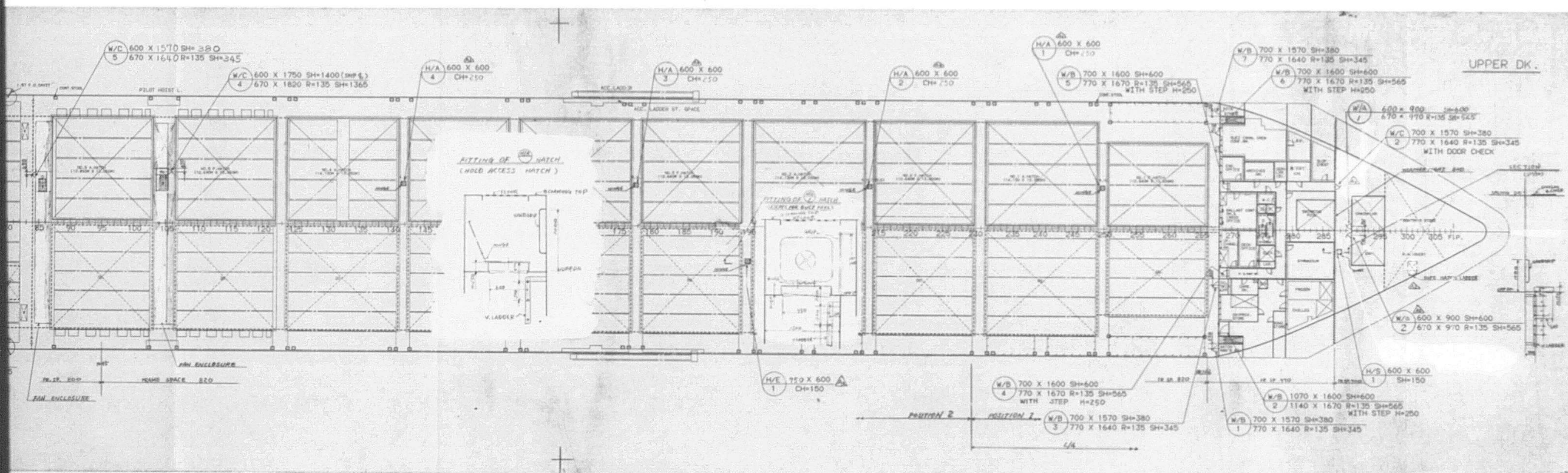
CHECKED

ESCAPE LATCH

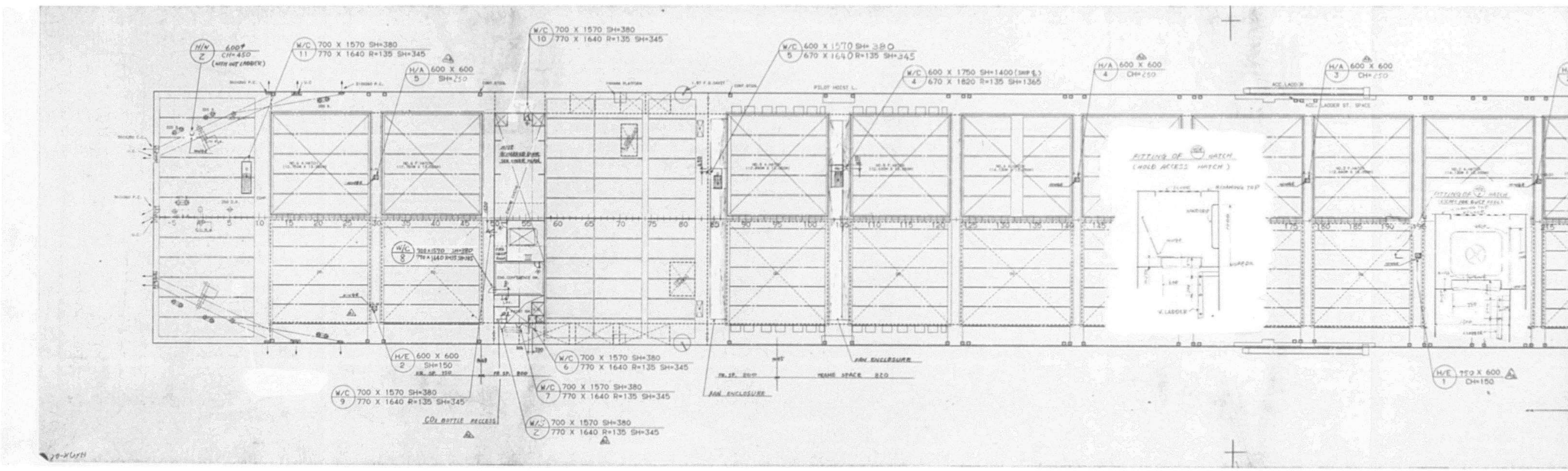
DRAWN | 3 ANGLE PROJ | SCALE | CLASS | INDEX | DRAWING NO.

NAKA IRON WORKS CO.,LTD

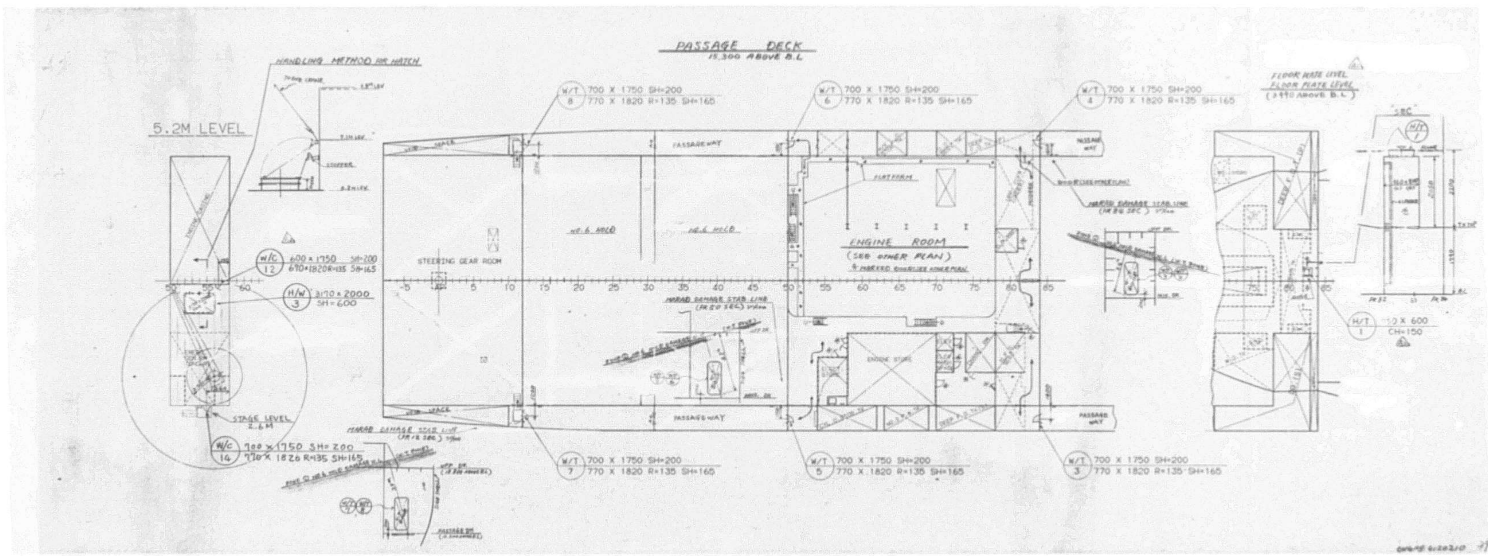
DWG NO 412D210 37


UPPER DK.
W/C 5 600 X 1570 SH=380 670 X 1640 R=135 SH=345
W/C 4 600 X 1750 SH=1400 670 X 1820 R=135 SH=1365
H/A 4 600 X 600 CH=250
H/A 3 600 X 600 CH=250
H/A 2 600 X 600 CH=250
H/A 1 600 X 600 CH=250
W/B 5 700 X 1600 SH=600 770 X 1670 R=135 SH=565 WITH STEP H=250
W/B 7 700 X 1570 SH=380 770 X 1640 R=135 SH=345
W/B 6 700 X 1600 SH=600 770 X 1670 R=135 SH=565 WITH STEP H=250
W/C 2 700 X 1570 SH=380 770 X 1640 R=135 SH=345 WITH DOOR CHECK
FITTING OF HATCH (HOLD ACCESS HATCH)
V. LADDER
H/E 1 750 X 600 CH=150
W/B 4 700 X 1600 SH=600 770 X 1670 R=135 SH=565 WITH STEP H=250
W/B 3 700 X 1570 SH=380 770 X 1640 R=135 SH=345
W/B 2 1070 X 1600 SH=600 1140 X 1670 R=135 SH=565 WITH STEP H=250
W/B 1 700 X 1570 SH=380 770 X 1640 R=135 SH=345
W/A 2 600 X 900 SH=600 670 X 970 R=135 SH=565
H/S 1 600 X 600 SH=150
POSITION 2
POSITION 1
FAN ENCLOSURE

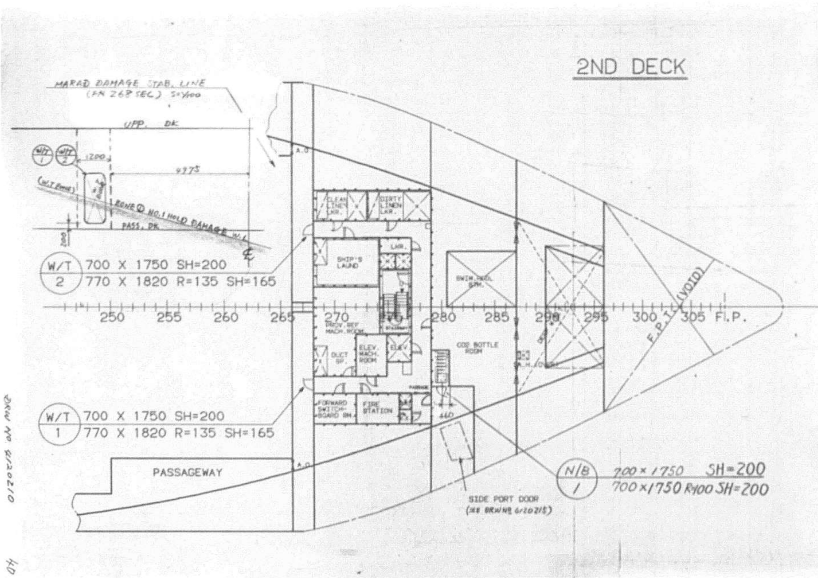
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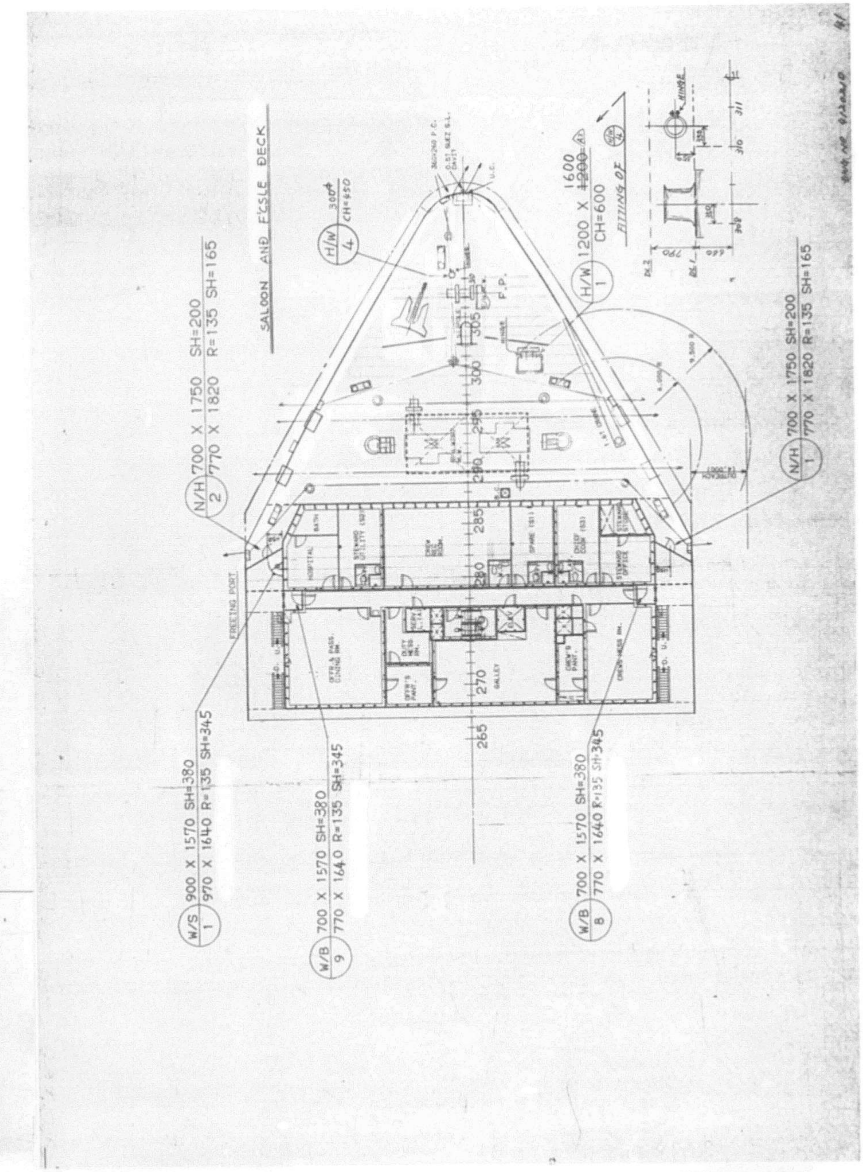

W/C 700 X 1570 SH=380
10 770 X 1640 R=135 SH=345
W/C 700 X 1570 SH=380
11 770 X 1640 R=135 SH=345
H/A 600 X 600
5 SH=250
W/C 600 X 1570 SH=380
5 670 X 1640 R=135 SH=345
W/C 600 X 1750 SH=1400
4 670 X 1820 R=135 SH=1365
H/A 600 X 600
4 CH=250
H/A 600 X 600
3 CH=250
FITTING OF HATCH
(HOLD ACCESS HATCH)
H/E 600 X 600
2 SH=150
W/C 700 X 1570 SH=380
6 770 X 1640 R=135 SH=345
W/C 700 X 1570 SH=380
9 770 X 1640 R=135 SH=345
W/C 700 X 1570 SH=380
7 770 X 1640 R=135 SH=345
W/C 700 X 1570 SH=380
Z 770 X 1640 R=135 SH=345
CO2 BOTTLE RECESS
FAN ENCLOSURE
FAN ENCLOSURE
H/E 1 CH=150

771



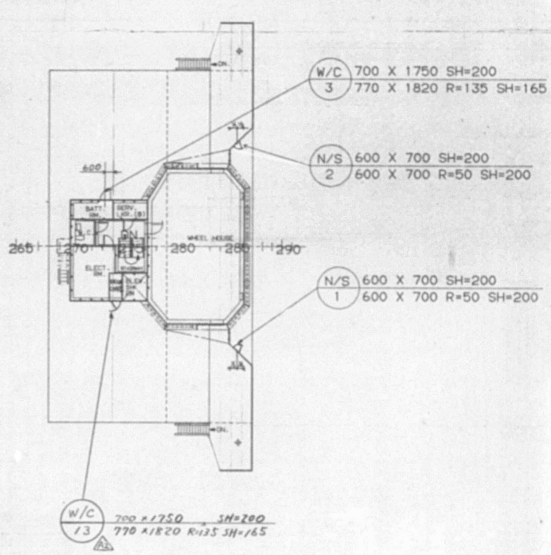
PASSAGE DECK
15,300 ABOVE B.L
HANDLING METHOD FOR HATCH
5.2M LEVEL
W/C 12 600 × 1750 SH=200
690×1820 R=135 SH=165
H/W 3 3170 × 2000
SH = 600
STAGE LEVEL
2.6M
W/C 14 700 × 1750 SH= 200
770 × 1820 R=135 SH=165
MARAD DAMAGE STAB LINE
W/T 8 700 X 1750 SH=200
770 X 1820 R=135 SH=165
W/T 7 700 X 1750 SH=200
770 X 1820 R=135 SH=165
W/T 6 700 X 1750 SH=200
770 X 1820 R=135 SH=165
W/T 5 700 X 1750 SH=200
770 X 1820 R=135 SH=165
W/T 4 700 X 1750 SH=200
770 X 1820 R=135 SH=165
W/T 3 700 X 1750 SH=200
770 X 1820 R=135 SH=165
STEERING GEAR ROOM
NO.6 HOLD
PASSAGEWAY
ENGINE ROOM
(SEE OTHER PLAN)
PLATFORM
ENGINE STORE
PASSAGE WAY
FLOOR PLATE LEVEL
H/T 1
CH=150


2ND DECK
MARAD DAMAGE STAB. LINE
UPP. DK
PASS. DK
W/T 2 700 X 1750 SH=200
770 X 1820 R=135 SH=165
W/T 1 700 X 1750 SH=200
770 X 1820 R=135 SH=165
250 255 260 265 270 280 285 290 295 300 305 F.P.
F.P.T. (VOID)
PASSAGEWAY
CO2 BOTTLE ROOM
FIRE STATION
SIDE PORT DOOR
N/B 1 700×1750 SH=200
700×1750 R100 SH=200


SALOON AND F'C'SLE DECK
N/H 2 700 X 1750 SH=200
770 X 1820 R=135 SH=165
N/H 1 700 X 1750 SH=200
770 X 1820 R=135 SH=165
H/W 1 1200 X 1600 CH=600
H/W 4 300ϕ CH=450
W/S 1 900 X 1570 SH=380
970 X 1640 R=135 SH=345
W/B 9 700 X 1570 SH=380
770 X 1640 R=135 SH=345
W/B 8 700 X 1570 SH=380
770 X 1640 R=135 SH=345
FITTING OF
FREEING PORT
GALLEY
HOSPITAL
265 270 280 285 290 295 300 305 F.P.

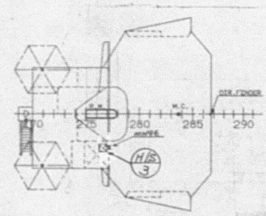
773

NAV.BRIDGE DECK



DRW NO 4120210 42

HOUSE TOP(07)



DWG 4120210

774

APPROVAL OF OWNER & REGULATORY BODIES								
ALT. NO.	OWNER		USCG		ABS		USPH	
	DATE	LETTER NO.	DATE	LETTER NO.	DATE	LETTER NO.	DATE	LETTER NO.
ORIGINAL	28MAY'86	OFTS/MES-476			8AUG'86	T-8-2		
1ST PART REV	29JUL'86	OFTS/MES-790			17SEP'86	T-8-2		
2ND PART REV	23JUL'86	TAM/24			17SEP'86	T-8-2		

FINISHEDPLAN

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SHIPYARD AND SHIP'S NO. & NAME			
MITSUI TAMANO		MITSUBISHI KOBE	
NO.1323	DOCTOR LYKES	NO.1158	JAMES LYKES
NO.1324	ALMERIA LYKES	NO.1159	JOSEPH LYKES
NO.1325	TILLIE LYKES	NO.1164	SOLON TURMAN

MITSUI ENGINEERING & SHIPBUILDING CO.,LTD.
TAMANO WORKS

SHIP DESIGN DEPARTMENT — MANAGER — STRUCTURE DESIGN SEC. — SEC.CHIEF

SHIP'S NO. **1325** SHIP'S NAME **TILLIE LYKES**

ハッチコーミング
HATCH COAMING

DATE (TEL. 3227)
JOB NO. TS1323/24/25 SCALE 1/100, 1/50
LYKES REF. NO. 160206
MITSUI DRAWING NO. 2101311

(31 SHEETS WITH COVER)

PLAN RECORD			
ALT. NO.	MARK	ALTERATION/DESCRIPTION	DATE & SIGNATURE
		"PREPARED FOR S.NO.1323 AS FINISHED PLAN, MADE APPLICABLE TO S.NO.1324 AND S.NO.1325."	NOV.28.'86
		FOR APL MODIFICATIONS THIS DRAWING WAS MODIFIED PARTLY, AND THESE WERE SHOWN ON 'MODIFICATION PLAN OF No.1 HOLD(AFT) CONT. SUPP. (40'/45' → 40')" (MES DWG No. 2107321M PAGE 4, 15, 23~30) AND 'MODIFICATION PLAN OF No.4 HOLD (AFT) CONT. SUPP. (20'×2 → 45')" (MES DWG No. 2107320M PAGE 3)	

DWG.NO. 2101311-1

NOTES:-

1. BOTH SIDES TO BE SYMMETRICAL EXCEPT SPECIFIED.
2. TRANS. SECTIONS TO BE "LOOKING FORE" EXCEPT SPECIFIED.
3. REFER TO "CONSTRUCTION DETAILS (DWG NO. 2100811)" FOR STRUCTURAL DETAILS OF MEMBERS, ETC. EXCEPT SPECIFIED.
4. REFER TO "WELDING TABLE (DWG NO. 2100832)" FOR LEG LENGTH OF WELDING EXCEPT SPECIFIED.

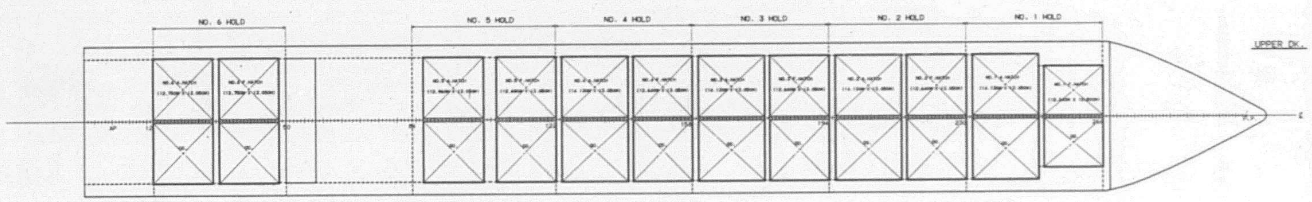
備考:-

1. 特記の他は，両舷対称とする。
2. 横断面図は，特記の他は後面を示す。
3. 構造詳細については，特記の他は「構造詳細図（図番2100811）」を参照のこと。
4. 溶接脚長については，特記の他は「溶接脚長表（図番2100832）」を参照のこと。

2101311-2

775

ARRANGEMENT OF HATCH



2101311 - 3/

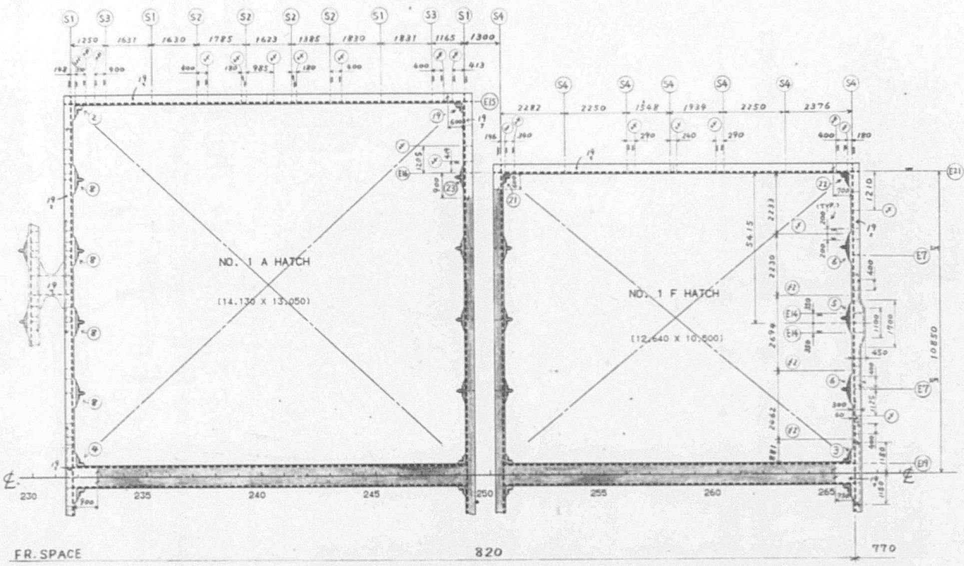
776

HATCH COAMING TOP
(NO. 1 HOLD)

HATCH COAM. TOP PLAN

NO. 1 HOLD

SIMILAR TO NO. 4 HOLD EXCEPT SPECIFIED



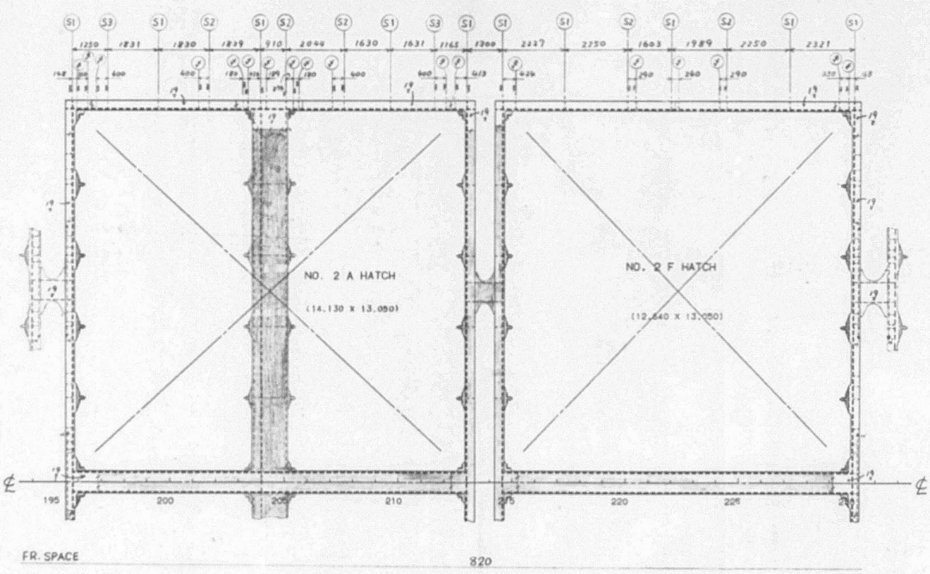
2101311 - 4/

HATCH COAMING TOP
(NO. 2 HOLD)

HATCH COAM. TOP PLAN

NO. 2 HOLD

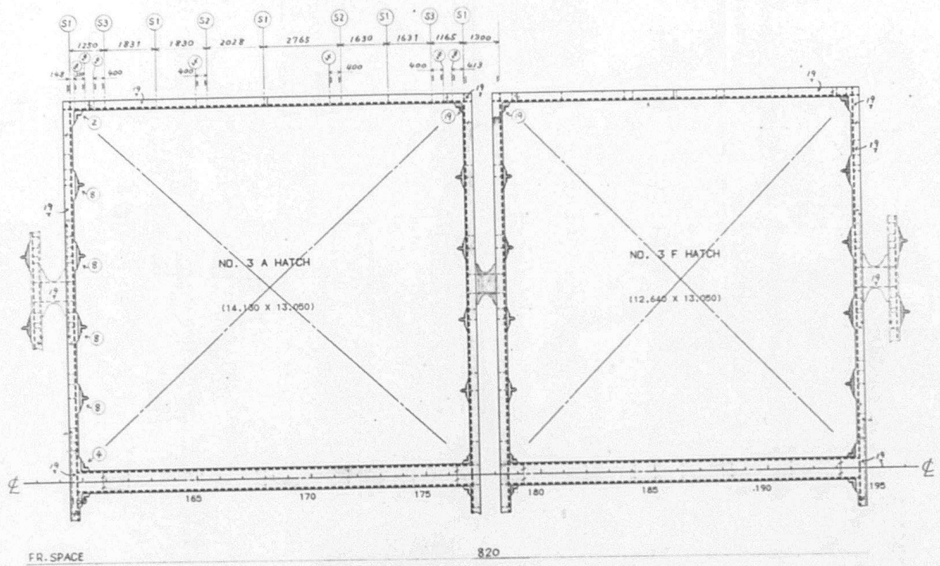
SIMILAR TO NO. 4 HOLD EXCEPT SPECIFIED



2101311 - 5/

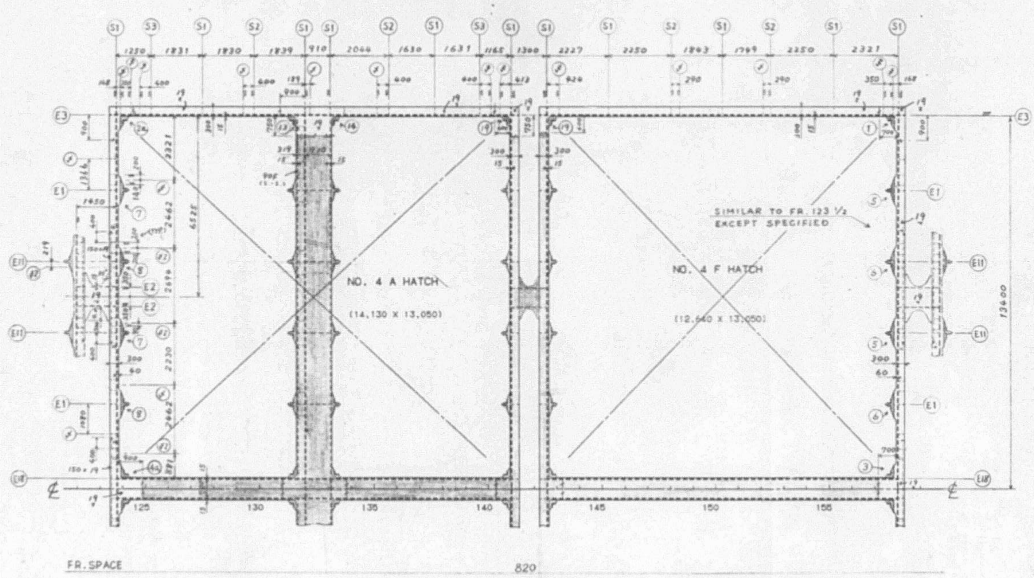
777

HATCH COAM. TOP PLAN
NO. 3 HOLD
SIMILAR TO NO.4 HOLD EXCEPT SPECIFIED



2101311 - 6/

HATCH COAM. TOP PLAN
NO. 4 HOLD
(TYPICAL)



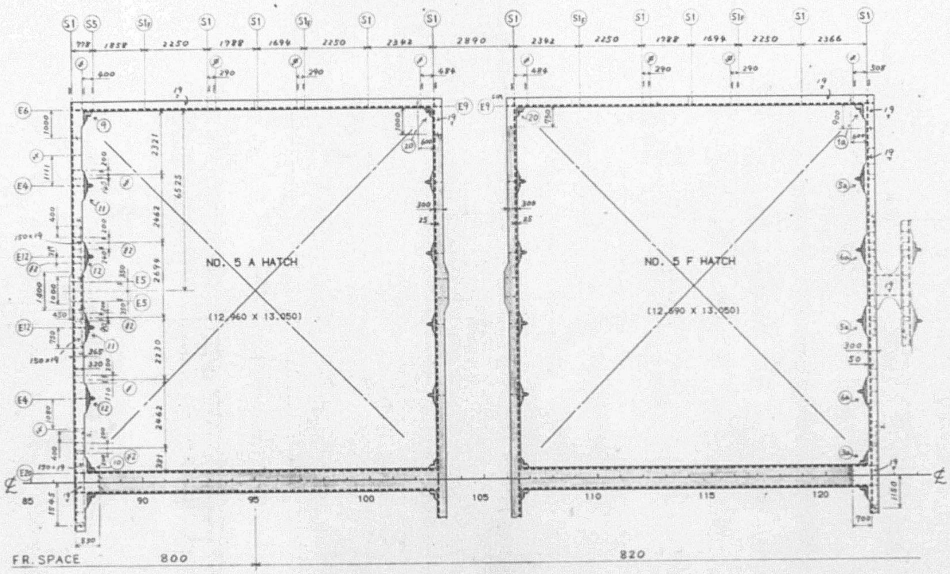
2101311 - 7/

HATCH COAMING TOP (NO. 5 HOLD)

HATCH COAM. TOP PLAN

NO. 5 HOLD

SIMILAR TO NO. 4 HOLD EXCEPT SPECIFIED



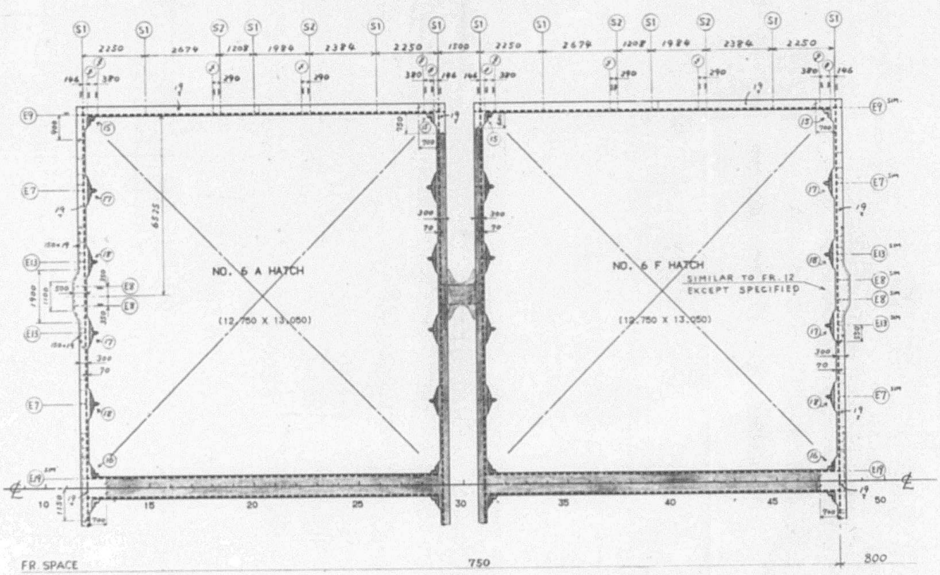
2101311 -8/

HATCH COAMING TOP (NO. 6 HOLD)

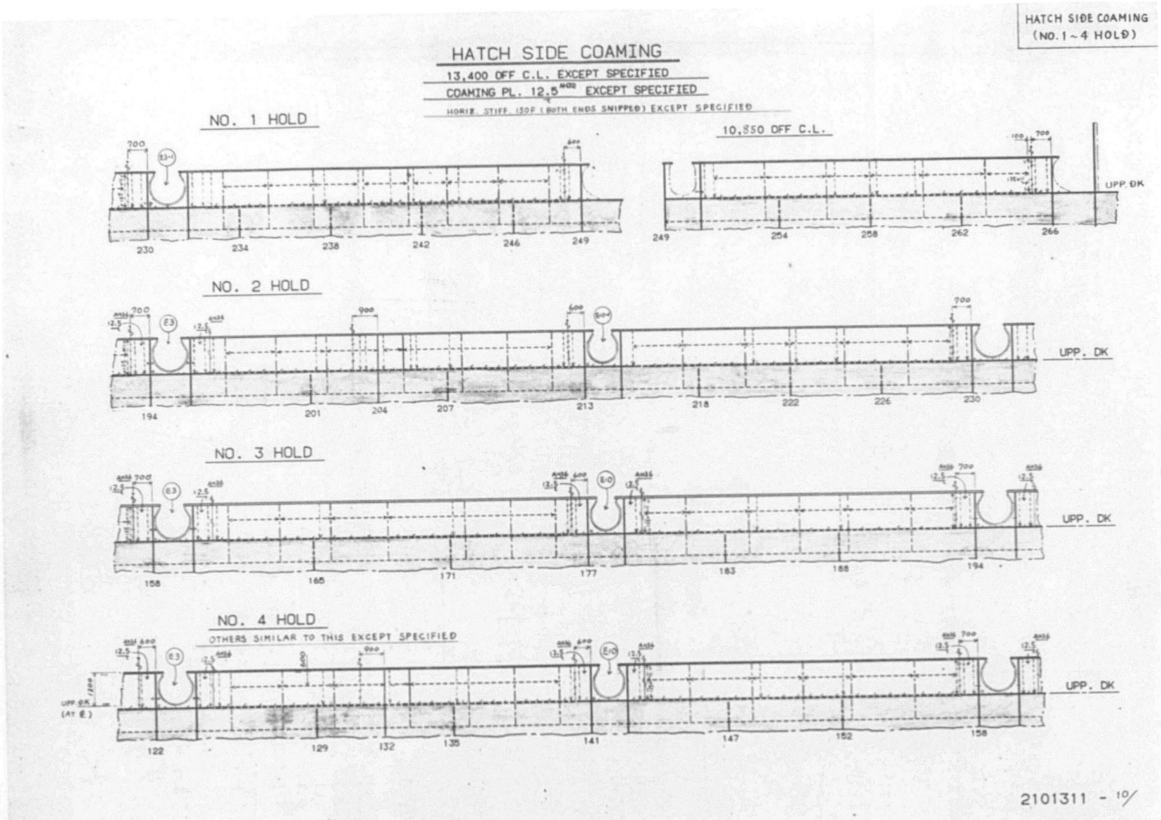
HATCH COAM. TOP PLAN

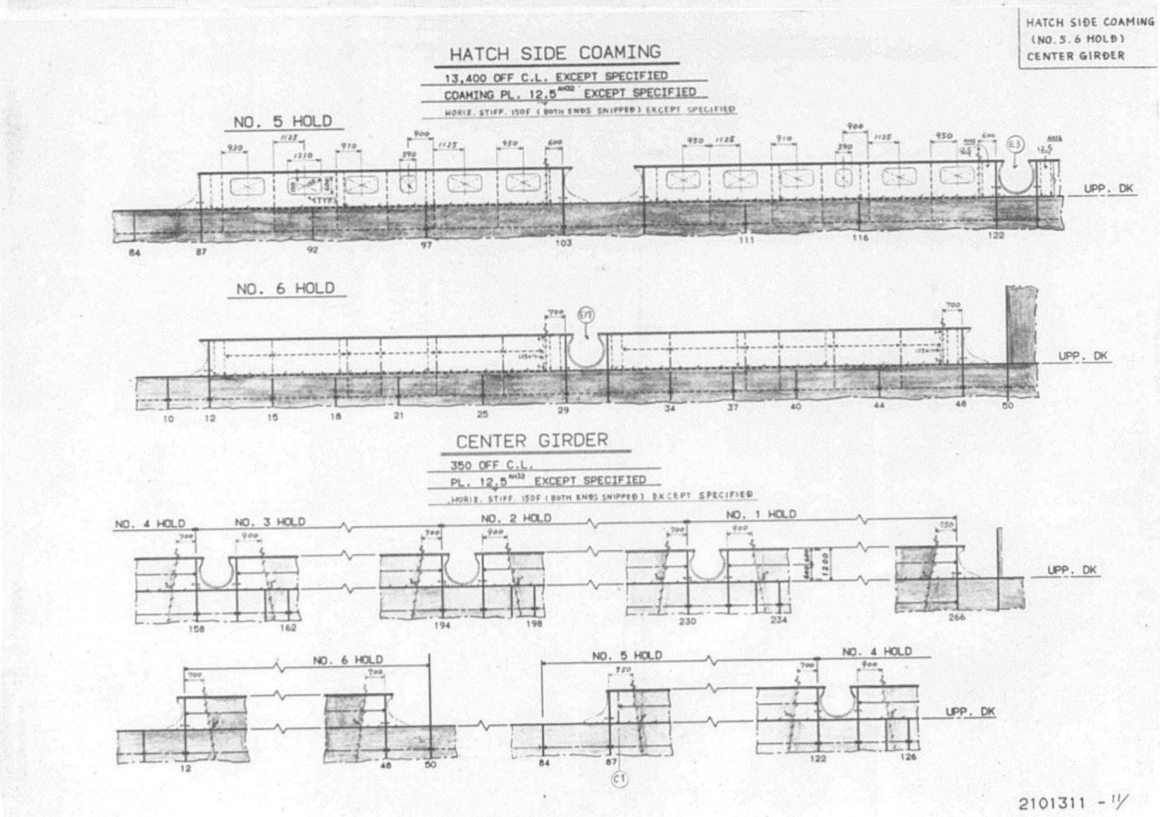
NO. 6 HOLD

SIMILAR TO NO. 4 HOLD EXCEPT SPECIFIED



2101311 -9/


HATCH SIDE COAMING
(NO. 1 ~ 4 HOLD)
HATCH SIDE COAMING
13,400 OFF C.L. EXCEPT SPECIFIED
COAMING PL. 12.5 EXCEPT SPECIFIED
HORIZ. STIFF. 150F (BOTH ENDS SNIPPED) EXCEPT SPECIFIED
NO. 1 HOLD
10,850 OFF C.L.
NO. 2 HOLD
NO. 3 HOLD
NO. 4 HOLD
OTHERS SIMILAR TO THIS EXCEPT SPECIFIED
UPP. DK
2101311 - 10/


HATCH SIDE COAMING
(NO. 5, 6 HOLD)
CENTER GIRDER
HATCH SIDE COAMING
13,400 OFF C.L. EXCEPT SPECIFIED
COAMING PL. 12.5 EXCEPT SPECIFIED
HORIZ. STIFF. 150F (BOTH ENDS SNIPPED) EXCEPT SPECIFIED
NO. 5 HOLD
NO. 6 HOLD
CENTER GIRDER
350 OFF C.L.
PL. 12.5 EXCEPT SPECIFIED
HORIZ. STIFF. 150F (BOTH ENDS SNIPPED) EXCEPT SPECIFIED
NO. 4 HOLD
NO. 3 HOLD
NO. 2 HOLD
NO. 1 HOLD
NO. 6 HOLD
NO. 5 HOLD
UPP. DK
2101311 - 11/

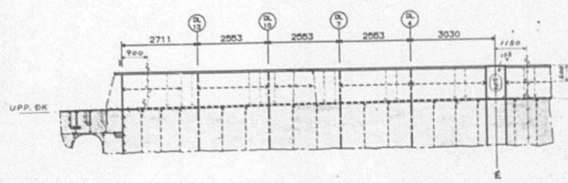
780

HATCH END COAMING

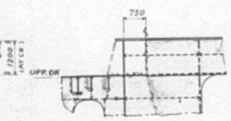
COAMING PL. 12.5 EXCEPT SPECIFIED

HORIZ. STIFF. 150F (BOTH ENDS SNIPPED) EXCEPT SPECIFIED

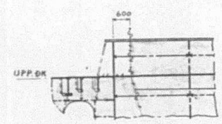
FR. 122, 158, 194, 230 SEC



FR. 141, 177, 213 SEC

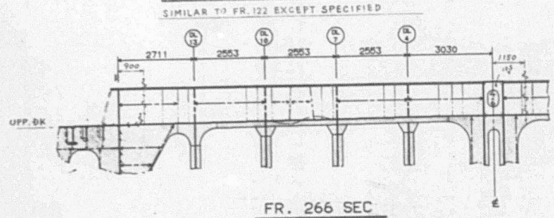


FR. 142 1/2, 178 1/2, 214 1/2 SEC

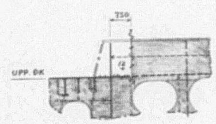


FR. 123 1/2, 159 1/2, 195 1/2, 231 1/2 SEC

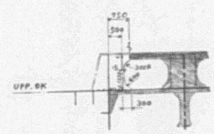
SIMILAR TO FR. 122 EXCEPT SPECIFIED



FR. 132, 204 SEC

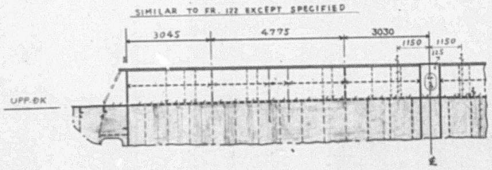


FR. 133 1/2, 205 1/2 SEC

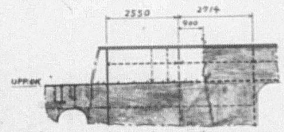


FR. 266 SEC

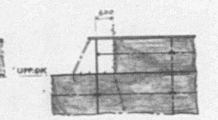
SIMILAR TO FR. 122 EXCEPT SPECIFIED



FR. 249 SEC



FR. 250 1/2 SEC



HATCH END COAMING

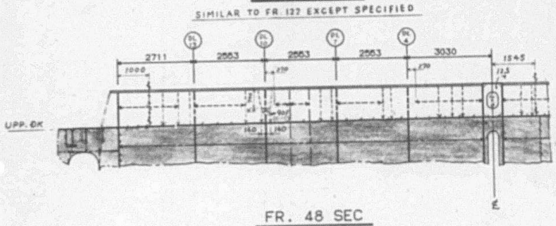
HATCH END COAMING

COAMING PL. 12.5 EXCEPT SPECIFIED

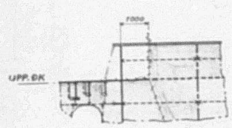
HORIZ. STIFF. 150F (BOTH ENDS SNIPPED) EXCEPT SPECIFIED

FR. 87 SEC

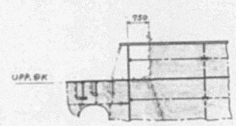
SIMILAR TO FR. 122 EXCEPT SPECIFIED



FR. 103 SEC

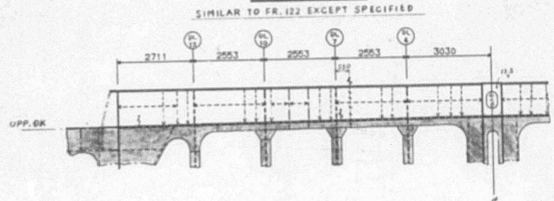


FR. 106 1/2 SEC

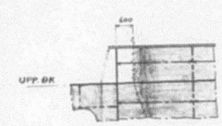


FR. 48 SEC

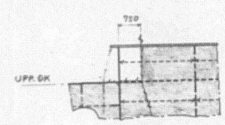
SIMILAR TO FR. 122 EXCEPT SPECIFIED



FR. 31 SEC

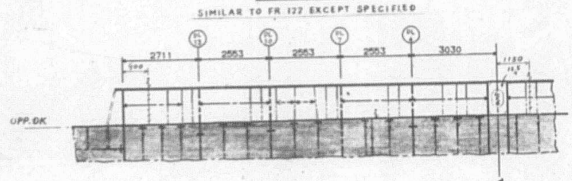


FR. 29 SEC

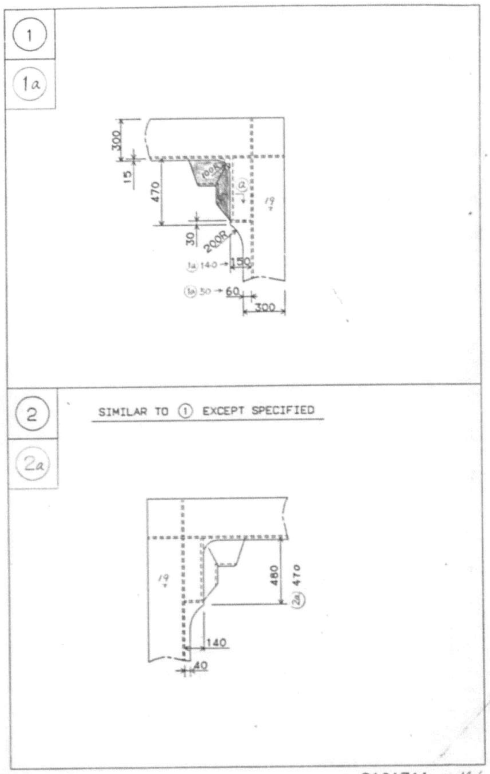


FR. 12 SEC

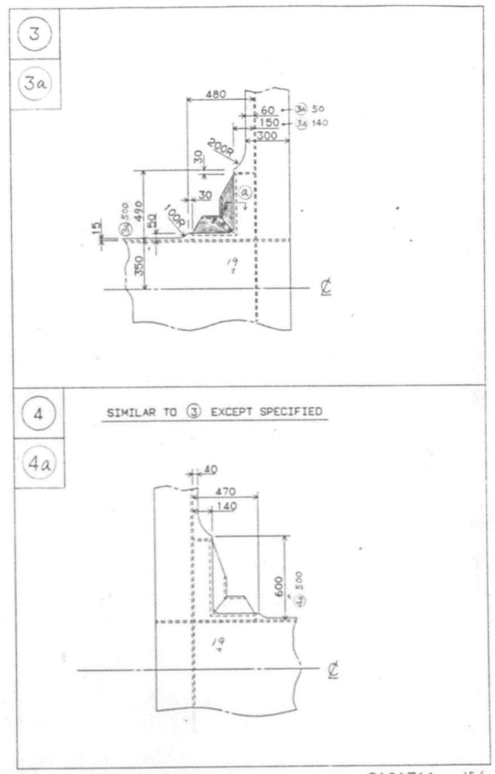
SIMILAR TO FR. 122 EXCEPT SPECIFIED



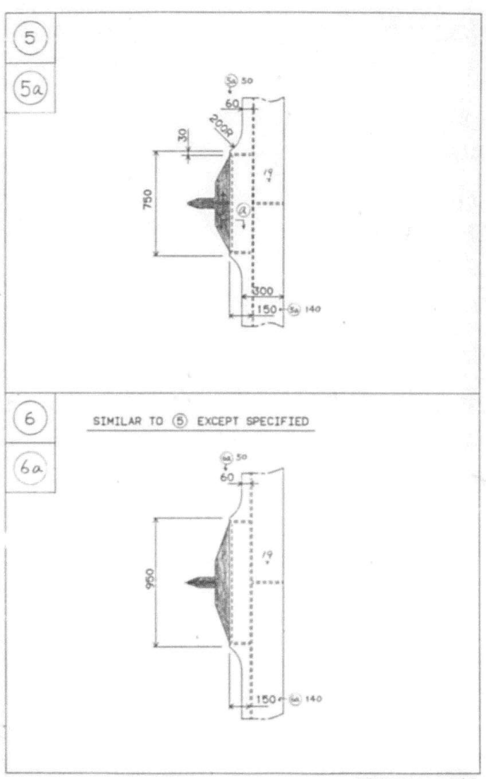
781



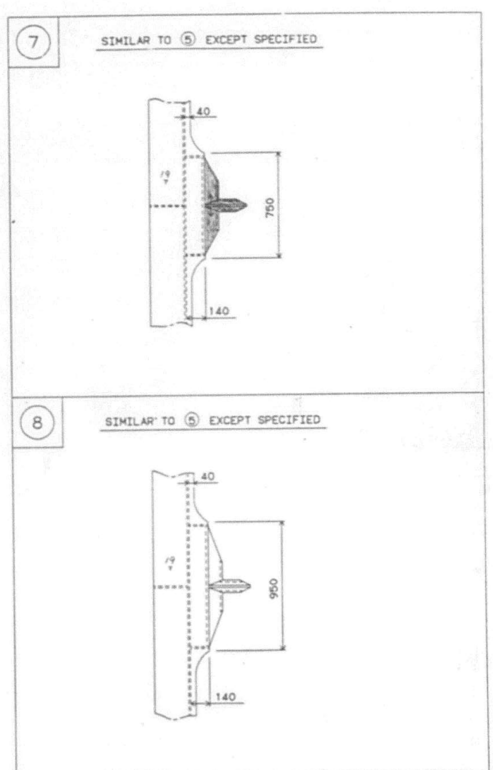
2101311 - 14/



2101311 - 15/



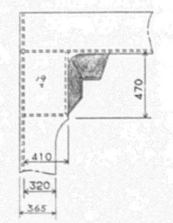
2101311 - 16/



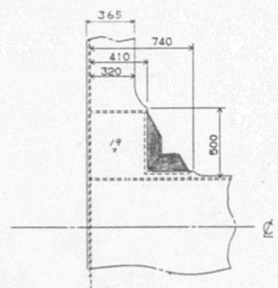
2101311 - 17/

782

(9) SIMILAR TO (1) EXCEPT SPECIFIED

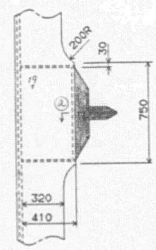


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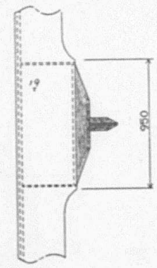


2101311 - 18/

(11)

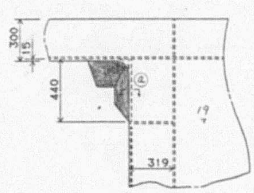


(12) SIMILAR TO (11) EXCEPT SPECIFIED

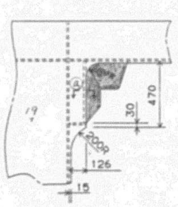


2101311 - 19/

(13)

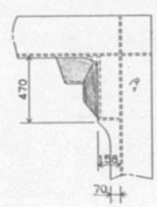


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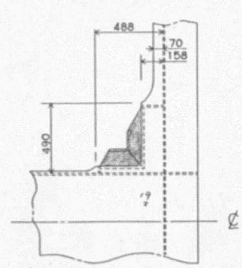


2101311 - 20/

(15) SIMILAR TO (1) EXCEPT SPECIFIED



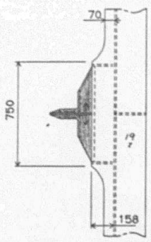
(16) SIMILAR TO (3) EXCEPT SPECIFIED



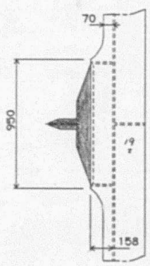
2101311 - 21/

783

(17) SIMILAR TO (5) EXCEPT SPECIFIED

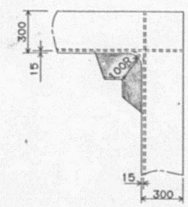


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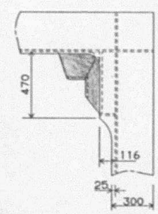


2101311 - 22/

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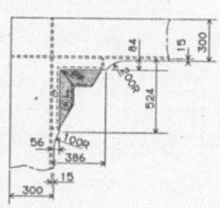


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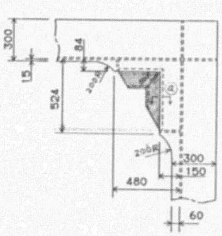


2101311 - 23/

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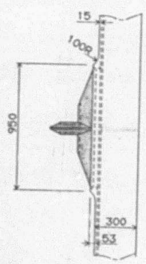


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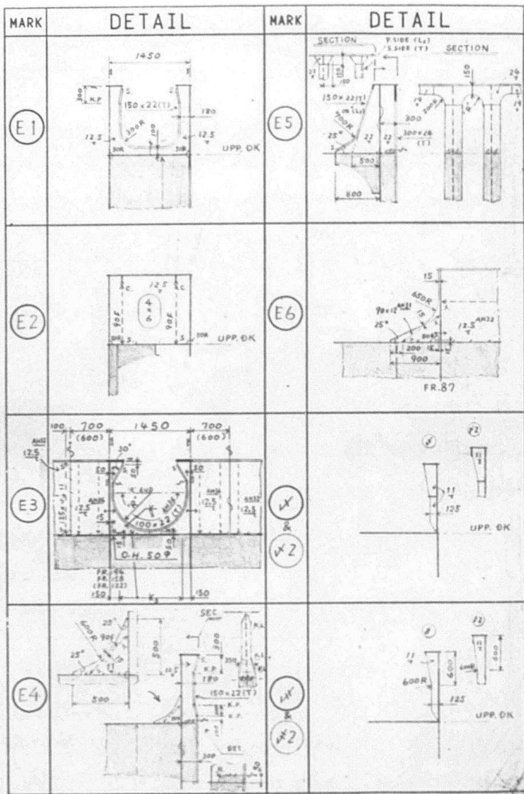


2101311 - 24/

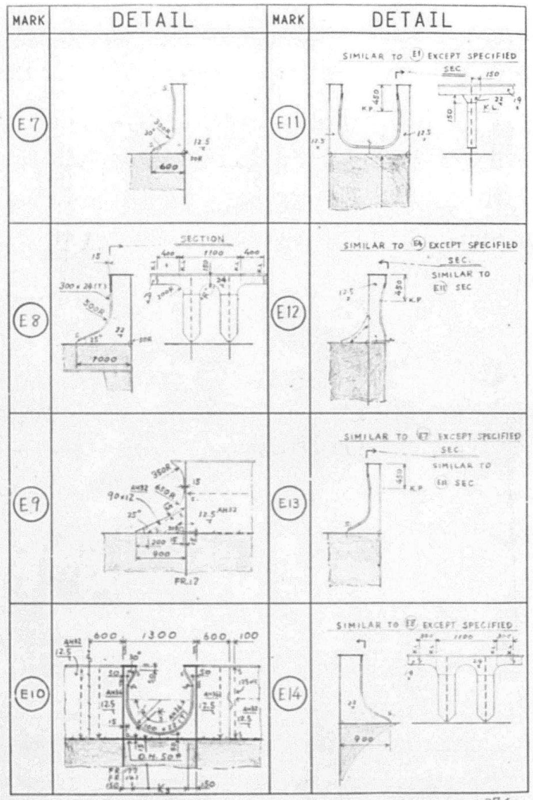
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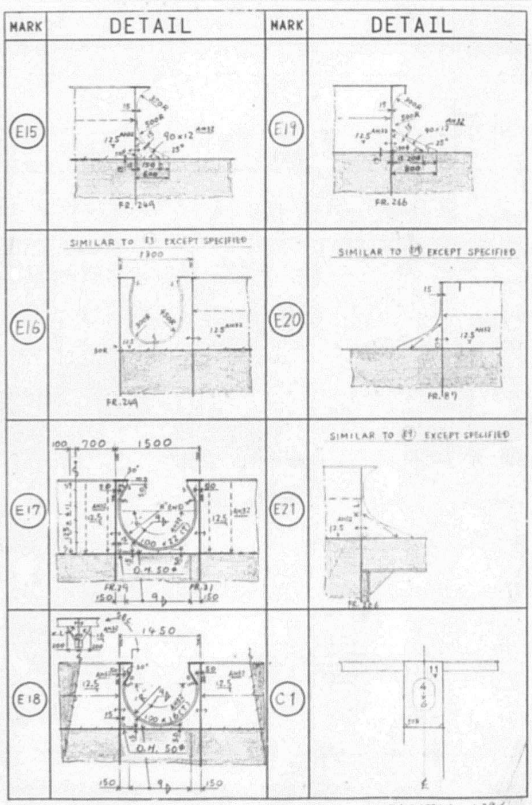
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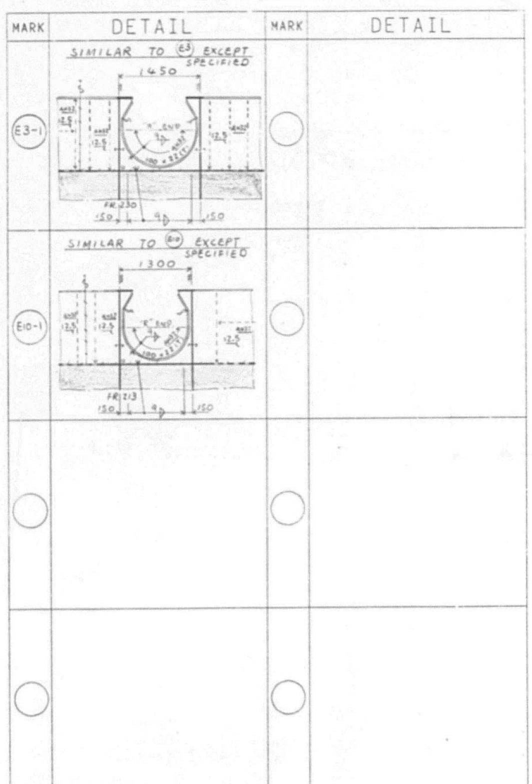
2101311 - 26



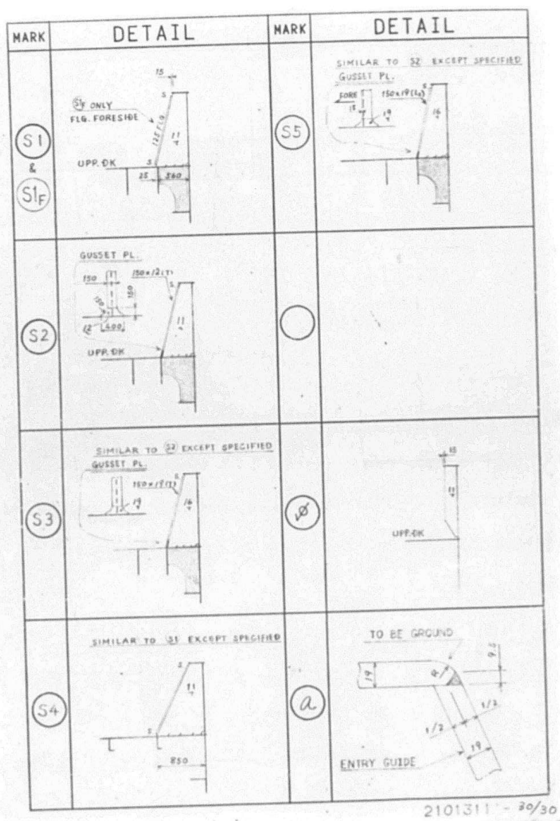
2101311 - 27



2101311 - 28



2101311 - 29



2101311 - 30/30

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PLAN RECORD BY MHI

ALT. NO.	MARK	DESCRIPTION	DATE	BY
ORIG.		FOLLOWED MES ORIGINAL PLAN	MAY 22 '85	
-10	A	PREPARED TO MODIFICATION FOR MHI BUILDING SHIPS. 1. REARRANGED BLOCK JOINTS ON CENTER LINE BOX GIRDER. 2. SHIFTED BLOCK JOINTS ON FR. 48 HATCH END COAMING. 3. DELETED BUTT JOINTS. BASED DWG MES DWG NO. 2101311 (INCL. PARTLY REVISED PLAN NO. 1 & 2)	JUL. 30, '85	
-20	B	1. MODIFIED UNDER STRUCTURE FR. 103 1/2 AFT WALL. 2. ADDED RIBS UNDER QUICK ACTING CLEAT.	DEC. 28, '85	
-21	C	ADDED REINFORCEMENT IN WAY OF PIPE HOLES ON FR. 124 & 115 & 145 & STAT, DUE TO ABS REQUIREMENT.	NOV. 12 '86	
-F		PREPARED AS FINISHED PLAN FOR S.NO. 1158	MAR. 11. '87	

SHIP DESIGNING DEPARTMENT HULL DESIGNING SECTION

CLASS ABS

ハッチコーミング
HATCH COAMING

ORDER 01-15800 ~~01-15900~~ ~~01-16400~~

DRAWING NO. HS-71400-F

LYKES REF. NO. 160206

MITSUBISHI HEAVY INDUSTRIES, LTD.
KOBE SHIPYARD & ENGINE WORKS

APPROVAL OF OWNER & REGULATORY BODIES

ALT. NO.	OWNER DATE	OWNER LETTER NO.	USCG DATE	USCG LETTER NO.	ABS DATE	ABS LETTER NO.	USPH DATE	USPH LETTER NO.
ORIGINAL								

SHIPYARD AND SHIP'S NO. & NAME

~~MITSUI TAMANO~~	MITSUBISHI KOBE
NO.1323 ~~DOCTOR LYKES~~	NO.1158 JAMES LYKES
NO.1324 ~~ALMERIA LYKES~~	NO.1159 ~~JOSEPH LYKES~~
NO.1325 ~~TILLIE LYKES~~	NO.1164 ~~SOLON TURMAN~~

MITSUI ENGINEERING & SHIPBUILDING CO.,LTD.
TAMANO WORKS

SHIP DESIGN DEPARTMENT MANAGER — STRUCTURE DESIGN SEC. — SEC. CHIEF N. Yamamoto

PARTLY REVISED PLAN NO. 2

ハッチコーミング
HATCH COAMING

SCALE 1/100, 1/30 — LYKES REF. NO. 160206 — MITSUI DRAWING NO. 2101311-2

(3 SHEETS WITH COVER)

PLAN RECORD

ALT. NO.	MARK	ALTERATION/DESCRIPTION	DATE & SIGNATURE
ORIGINAL		PREPARED FOR APPROVAL OF OWNER & ABS	May 10 '85
1	1	MISCELLANEOUS REVISION (DESIGN DEVELOPMENT)	JUN. 20 '85 M.O.
2	2	MISCELLANEOUS REVISION (DESIGN DEVELOPMENT)	JUL. 9 '85 N.Y

DWG. NO. 2101311-1/

NOTES:-

1. BOTH SIDES TO BE SYMMETRICAL EXCEPT SPECIFIED.
2. TRANS. SECTIONS TO BE "LOOKING FORE" EXCEPT SPECIFIED.
3. REFER TO "CONSTRUCTION DETAILS (DWG NO. 2100811)" FOR STRUCTURAL DETAILS OF MEMBERS, ETC. EXCEPT SPECIFIED.
4. REFER TO "WELDING TABLE (DWG NO. 2100832)" FOR LEG LENGTH OF WELDING EXCEPT SPECIFIED.

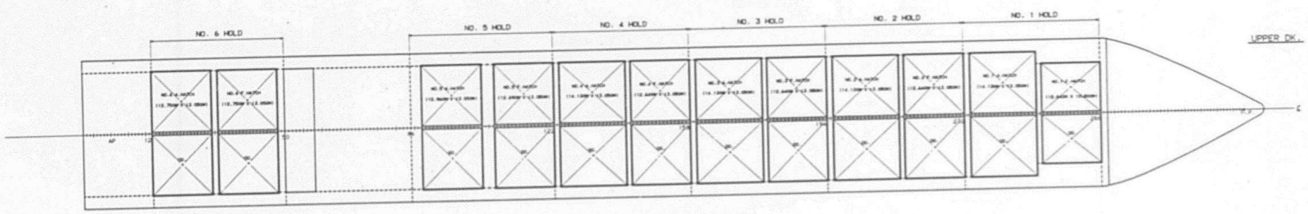
備考:-

1. 特記の他は，両舷対称とする。
2. 横断面図は，特記の他は後面を示す。
3. 構造詳細については，特記の他は "構造詳細図（図番 2100811）" を参照のこと。
4. 溶接脚長については，特記の他は "溶接脚長表（図番 2100832）" を参照のこと。

2101311-2/

787

ARRANGEMENT OF HATCH

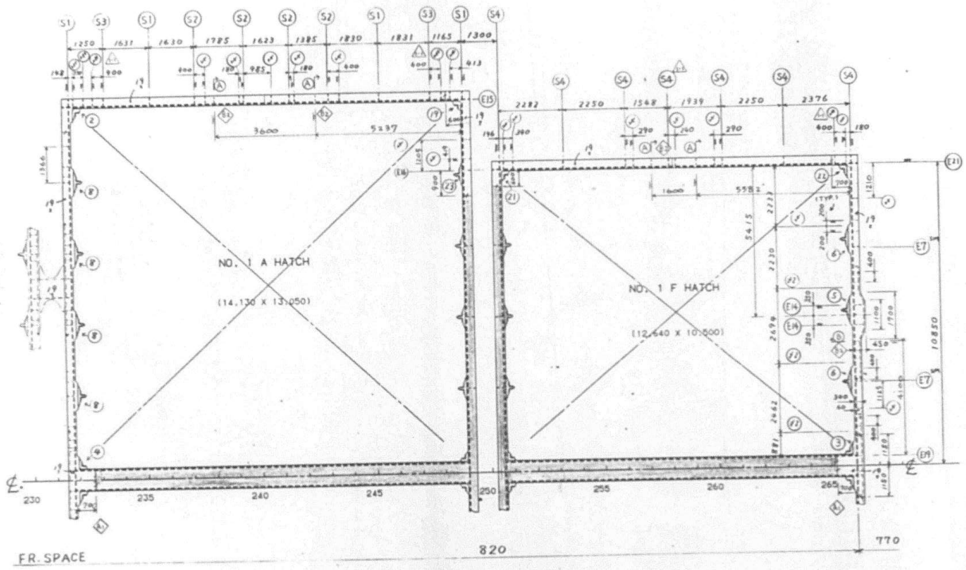


HATCH COAMING TOP
(NO. 1 HOLD)

HATCH COAM. TOP PLAN

NO. 1 HOLD

SIMILAR TO NO.4 HOLD EXCEPT SPECIFIED



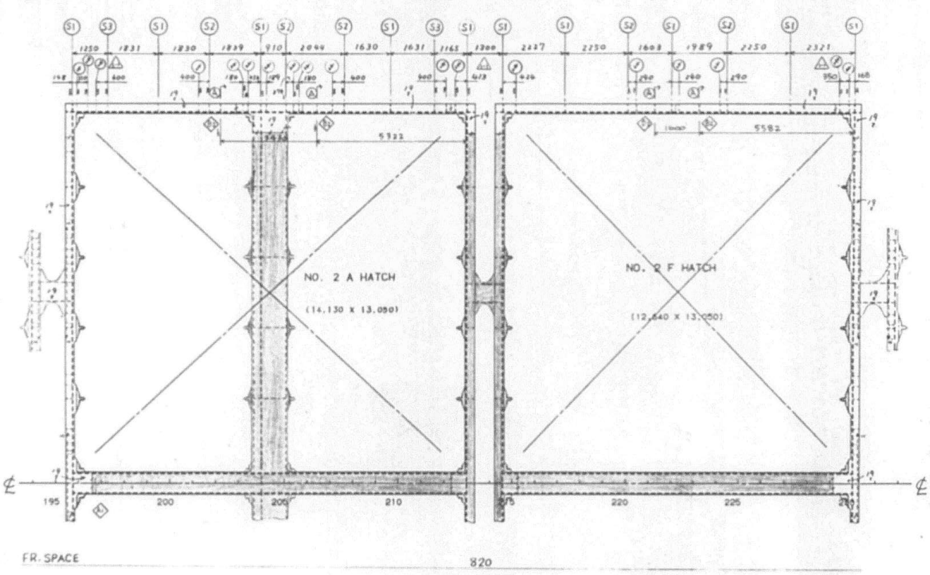
2101311 - 4/

HATCH COAMING TOP
(NO. 2 HOLD)

HATCH COAM. TOP PLAN

NO. 2 HOLD

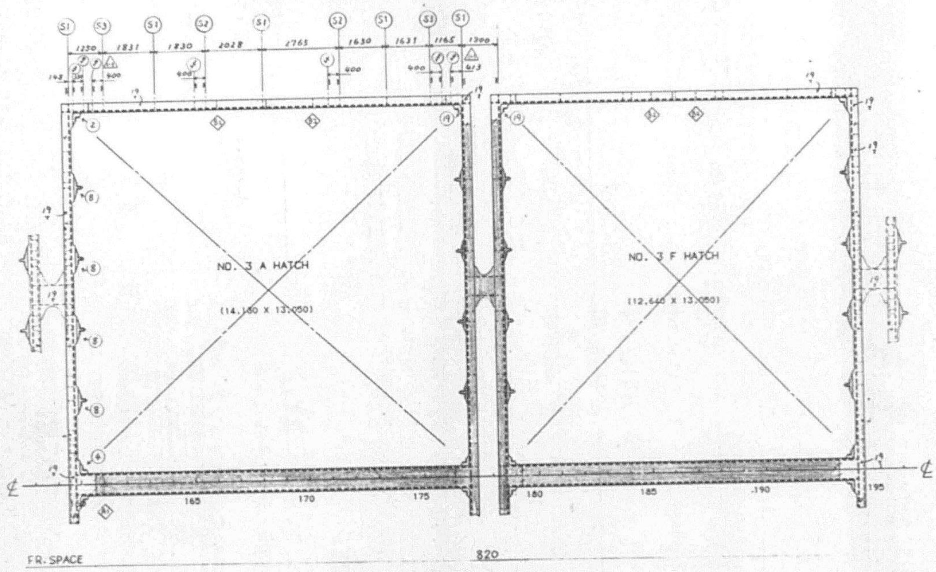
SIMILAR TO NO.4 HOLD EXCEPT SPECIFIED



2101311 - 5/

HATCH COAM. TOP
(NO.3 HOLD)

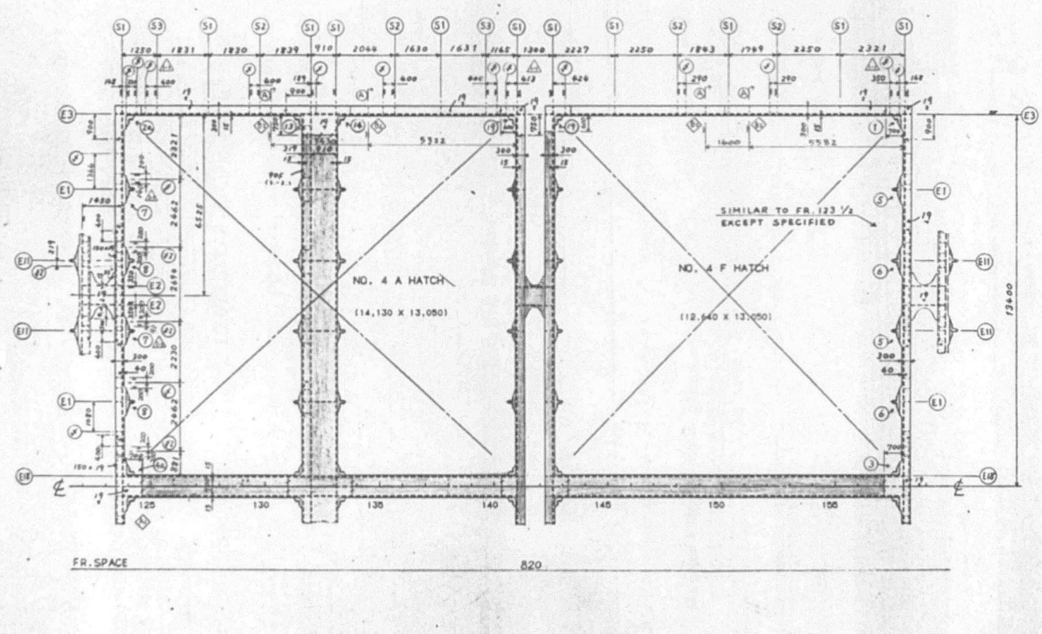
HATCH COAM. TOP PLAN
NO. 3 HOLD
SIMILAR TO NO.4 HOLD EXCEPT SPECIFIED



2101311 - 6/

HATCH COAMING TOP
(NO. 4 HOLD)

HATCH COAM. TOP PLAN
NO. 4 HOLD
(TYPICAL)



2101311 - 7/

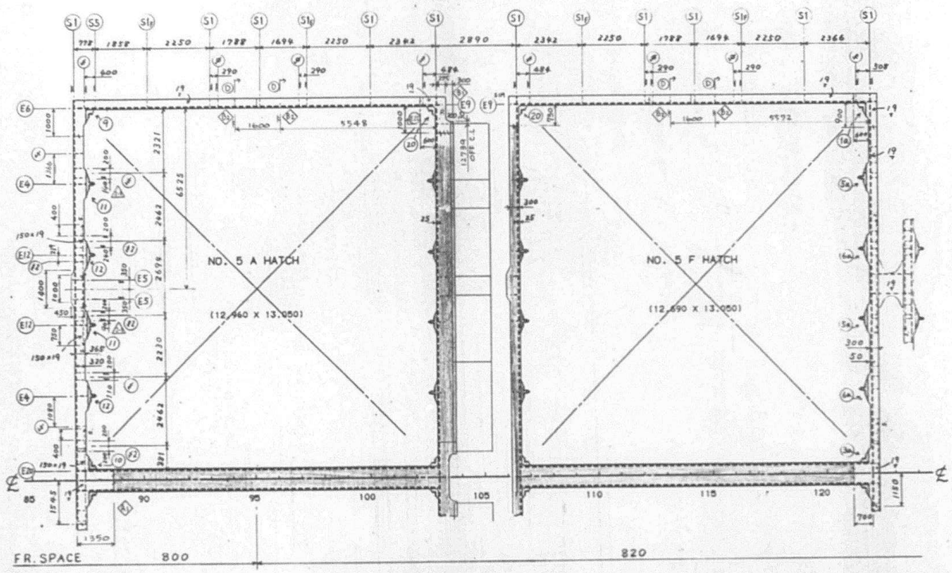
790

HATCH COAMING TOP
(NO. 5 HOLD)

HATCH COAM. TOP PLAN

NO. 5 HOLD

SIMILAR TO NO. 4 HOLD EXCEPT SPECIFIED



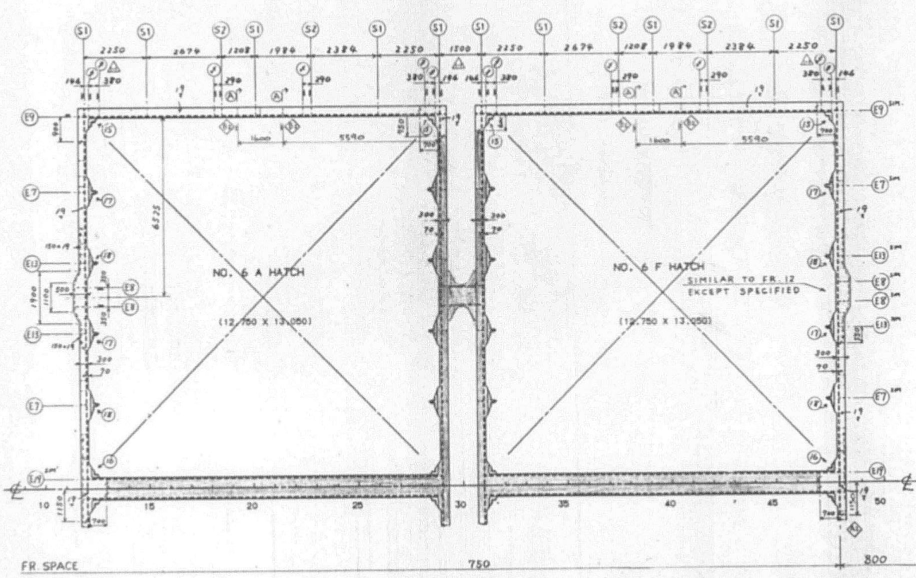
2101311 -8/

HATCH COAMING TOP
(NO. 6 HOLD)

HATCH COAM. TOP PLAN

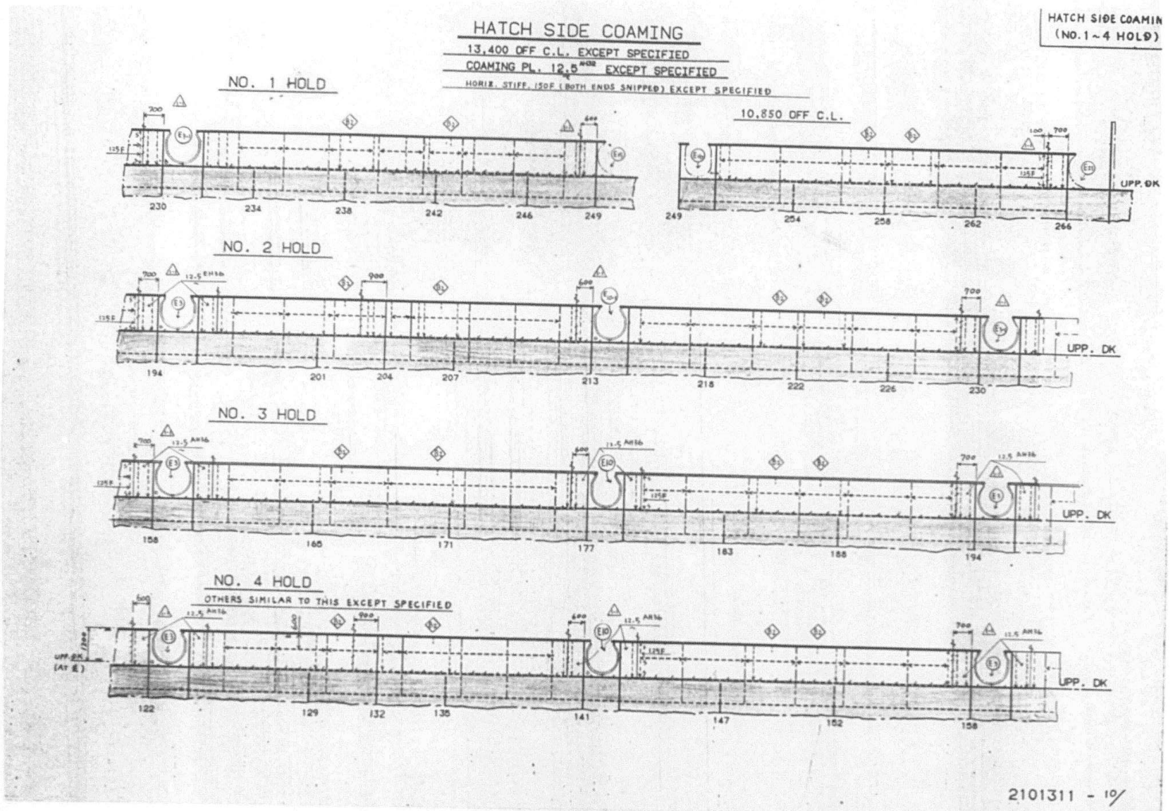
NO. 6 HOLD

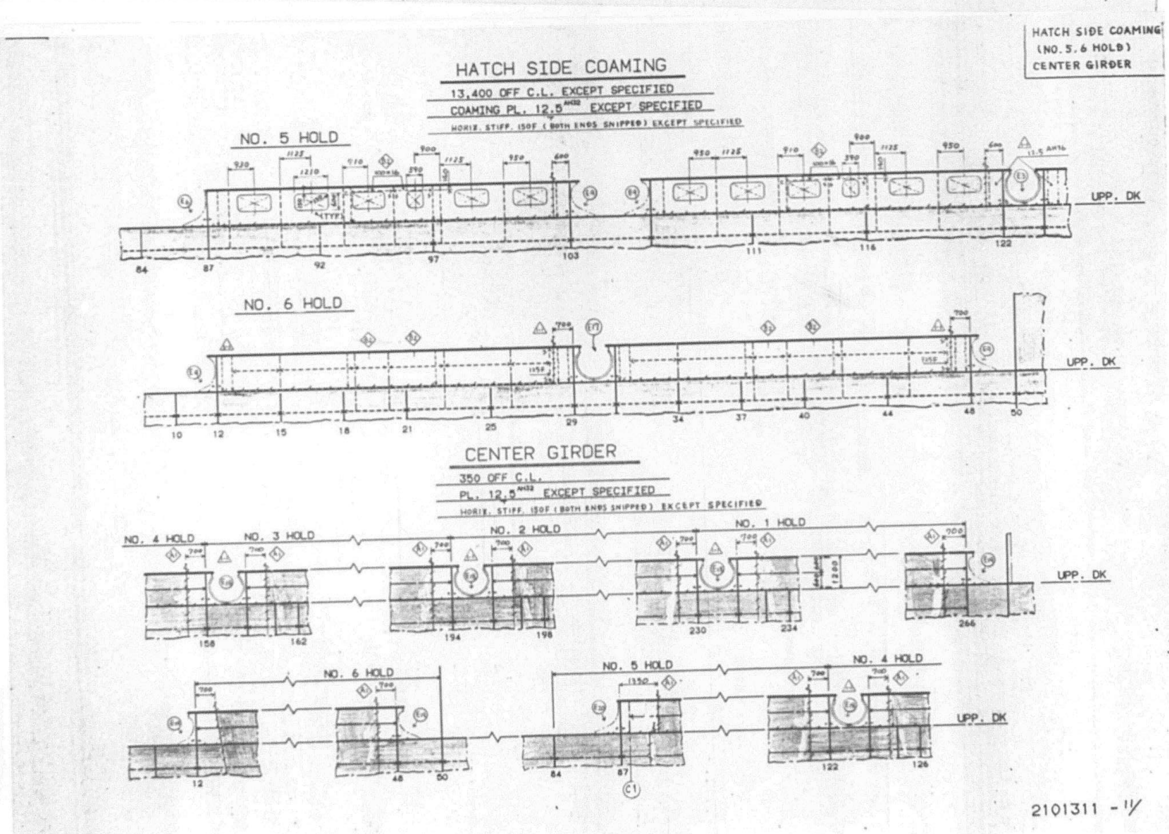
SIMILAR TO NO. 4 HOLD EXCEPT SPECIFIED

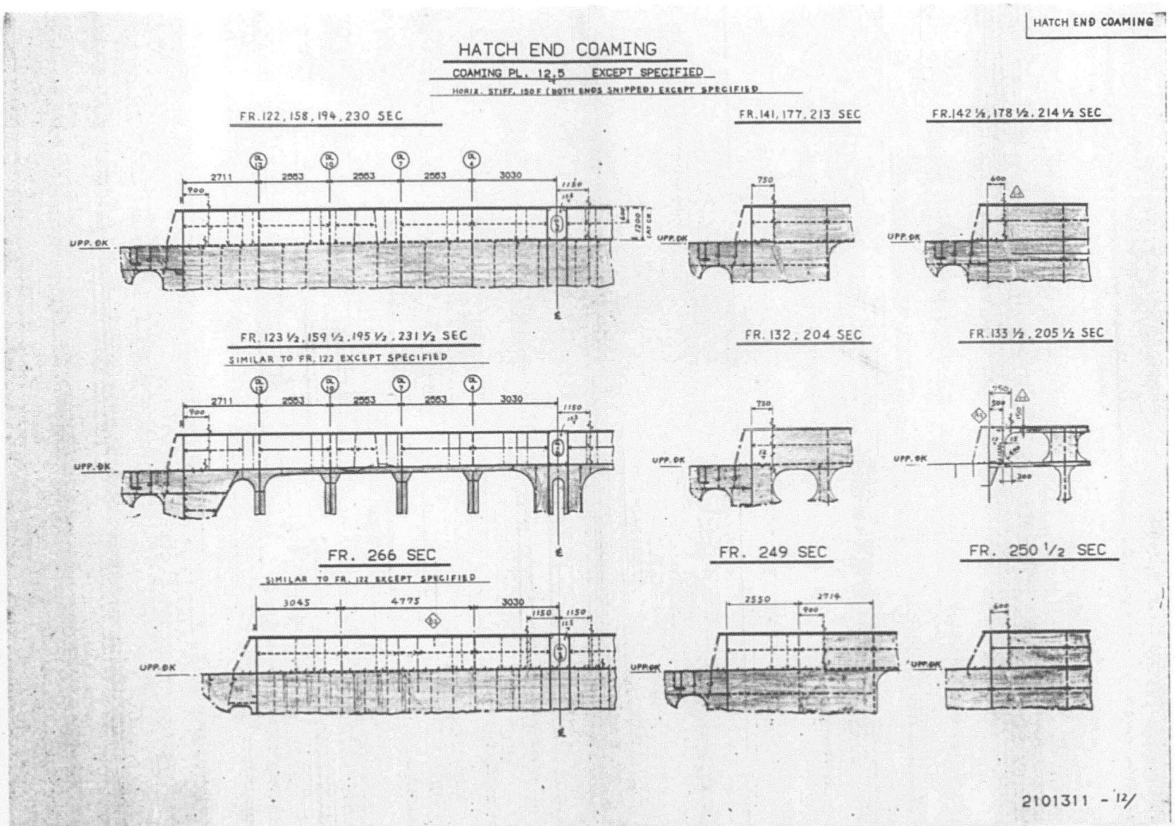


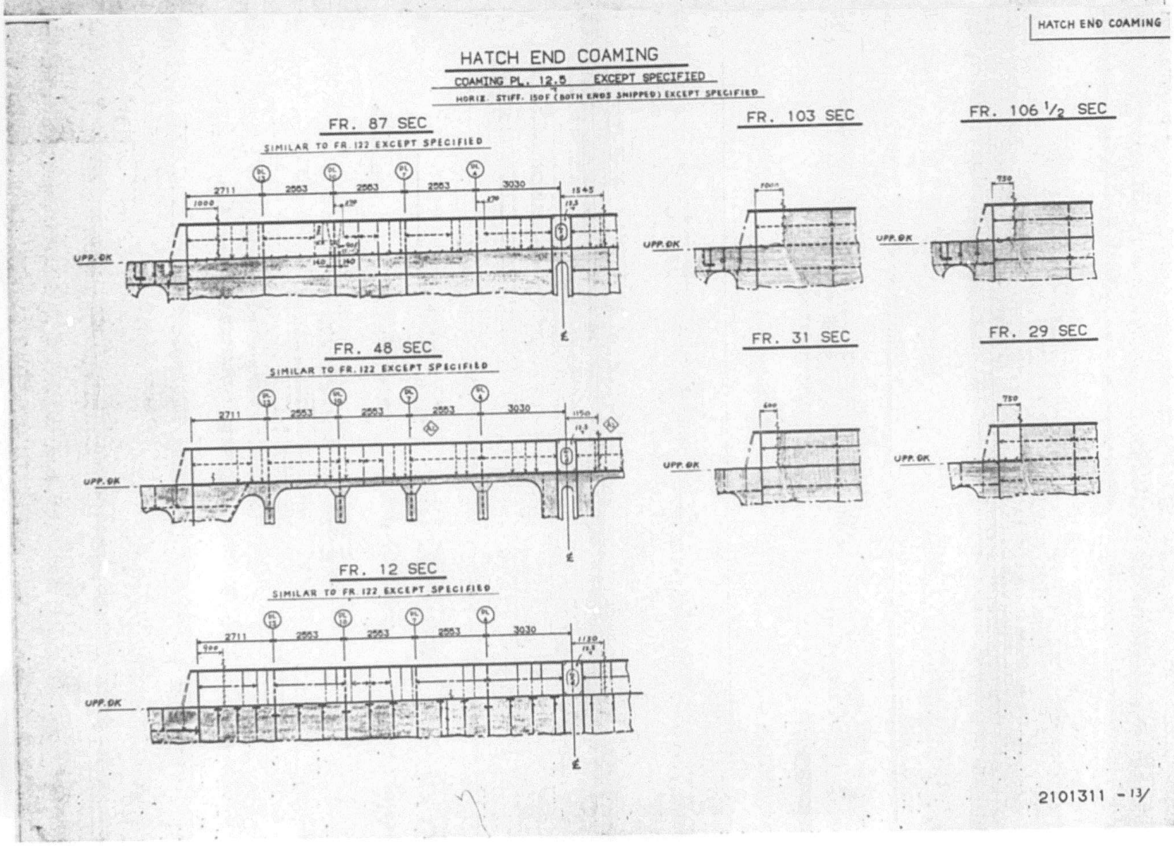
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791

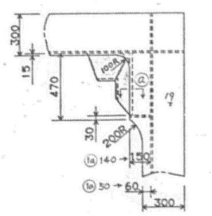

HATCH SIDE COAMING
(NO.1~4 HOLD)
HATCH SIDE COAMING
13,400 OFF C.L. EXCEPT SPECIFIED
COAMING PL. 12.5 AH32 EXCEPT SPECIFIED
HORIZ. STIFF. 150F (BOTH ENDS SNIPPED) EXCEPT SPECIFIED
NO. 1 HOLD
10,850 OFF C.L.
UPP. DK
NO. 2 HOLD
NO. 3 HOLD
NO. 4 HOLD
OTHERS SIMILAR TO THIS EXCEPT SPECIFIED
2101311 - 10/


HATCH SIDE COAMING
(NO. 5, 6 HOLD)
CENTER GIRDER
HATCH SIDE COAMING
13,400 OFF C.L. EXCEPT SPECIFIED
COAMING PL. 12.5 AH32 EXCEPT SPECIFIED
HORIZ. STIFF. 150F (BOTH ENDS SNIPPED) EXCEPT SPECIFIED
NO. 5 HOLD
NO. 6 HOLD
UPP. DK
CENTER GIRDER
350 OFF C.L.
PL. 12.5 AH32 EXCEPT SPECIFIED
HORIZ. STIFF. 150F (BOTH ENDS SNIPPED) EXCEPT SPECIFIED
NO. 4 HOLD
NO. 3 HOLD
NO. 2 HOLD
NO. 1 HOLD
NO. 6 HOLD
NO. 5 HOLD
2101311 - 11/

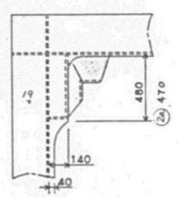

HATCH END COAMING
HATCH END COAMING
COAMING PL. 12.5 EXCEPT SPECIFIED
HORIZ. STIFF. 150F (BOTH ENDS SNIPPED) EXCEPT SPECIFIED
FR. 122, 158, 194, 230 SEC
FR. 141, 177, 213 SEC
FR. 142 ½, 178 ½, 214 ½ SEC
FR. 123 ½, 159 ½, 195 ½, 231 ½ SEC
SIMILAR TO FR. 122 EXCEPT SPECIFIED
FR. 132, 204 SEC
FR. 133 ½, 205 ½ SEC
FR. 266 SEC
SIMILAR TO FR. 122 EXCEPT SPECIFIED
FR. 249 SEC
FR. 250 ½ SEC
UPP. DK
2101311 - 12/


HATCH END COAMING
HATCH END COAMING
COAMING PL. 12.5 EXCEPT SPECIFIED
HORIZ. STIFF. 150F (BOTH ENDS SNIPPED) EXCEPT SPECIFIED
FR. 87 SEC
SIMILAR TO FR. 122 EXCEPT SPECIFIED
FR. 103 SEC
FR. 106 ½ SEC
FR. 48 SEC
SIMILAR TO FR. 122 EXCEPT SPECIFIED
FR. 31 SEC
FR. 29 SEC
FR. 12 SEC
SIMILAR TO FR. 122 EXCEPT SPECIFIED
UPP. DK
2101311 - 13/

① ⓵a

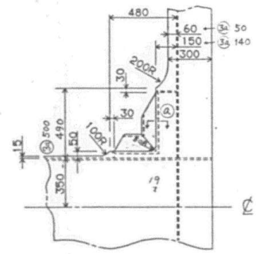


② ②a SIMILAR TO ① EXCEPT SPECIFIED

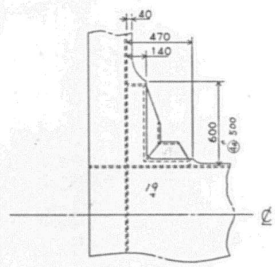


2101311 - 14/

③ ③a

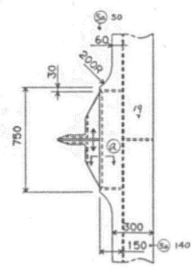


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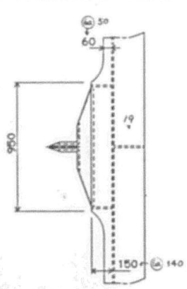


2101311 - 15/

⑤ ⑤a

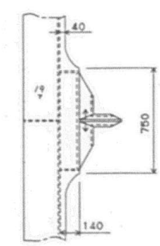


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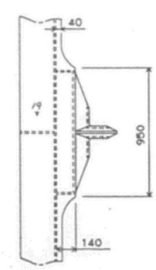


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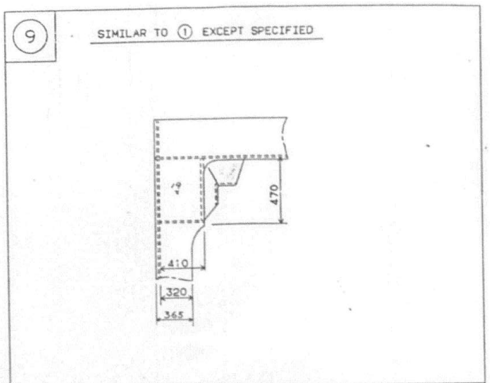
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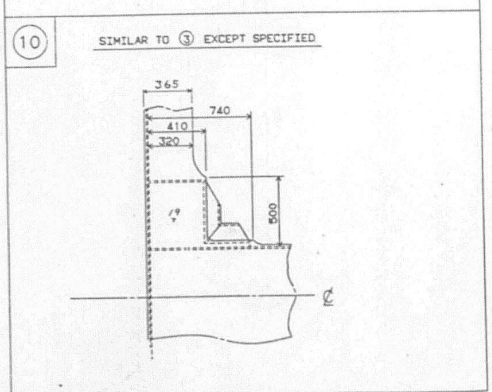


⑧ SIMILAR TO ⑤ EXCEPT SPECIFIED

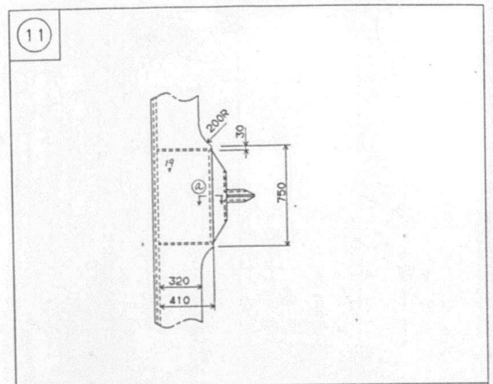


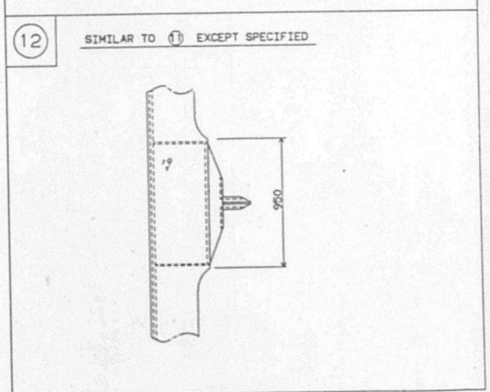
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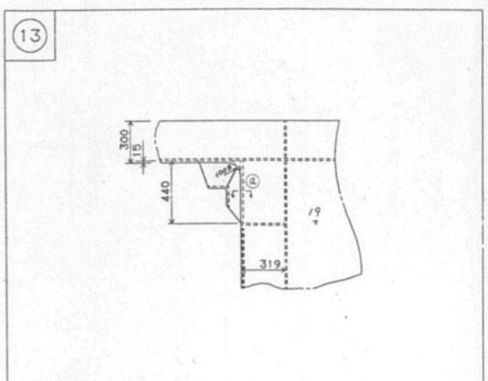


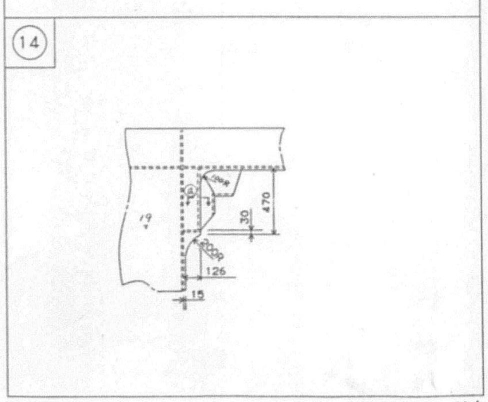
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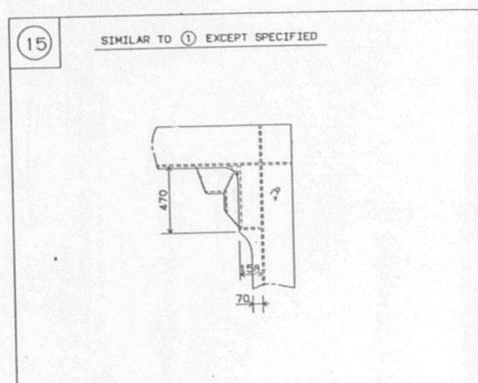


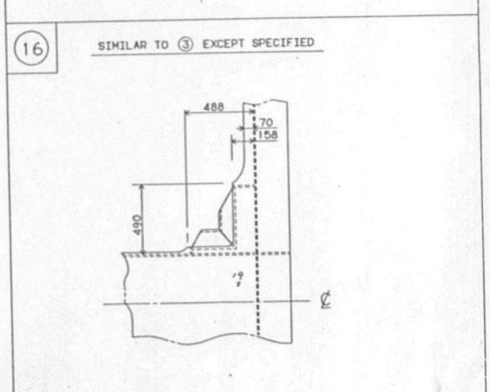
2101311 - 19/





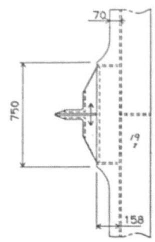
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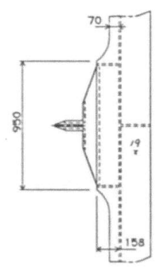


2101311 - 21/

(17) SIMILAR TO (5) EXCEPT SPECIFIED

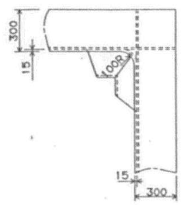


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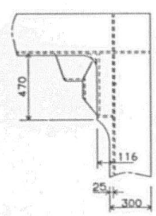


2101311 - 22/

(19)

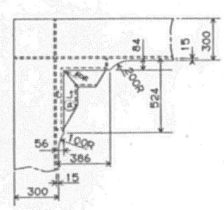


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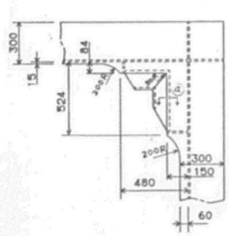


2101311 - 23/

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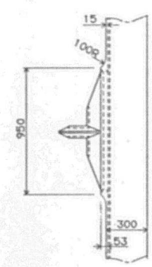


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2101311 - 24/

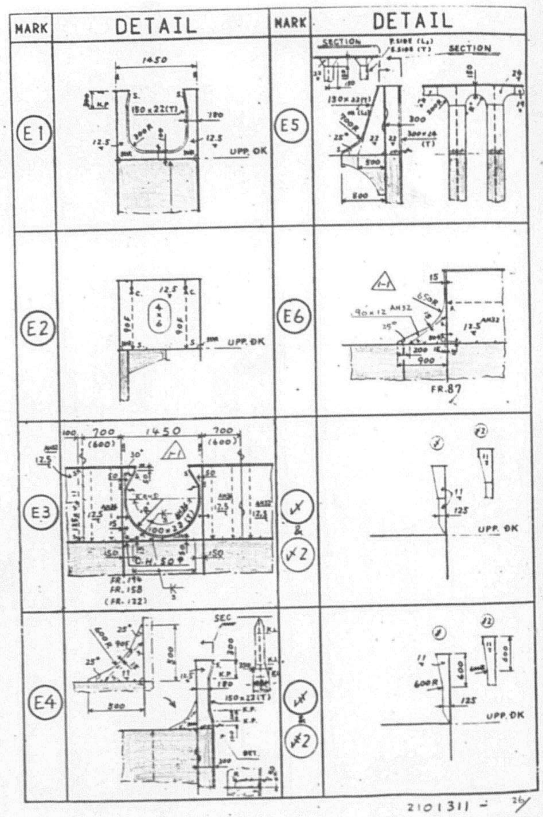
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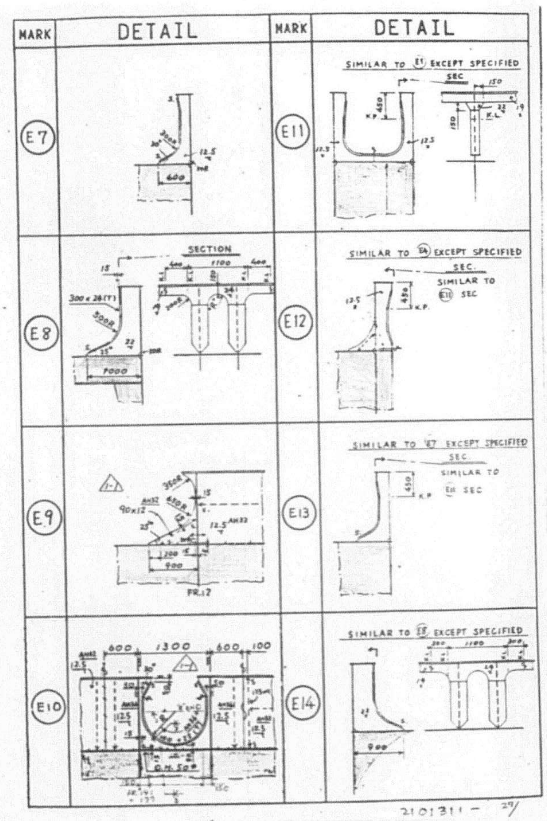
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2101311 - 25/

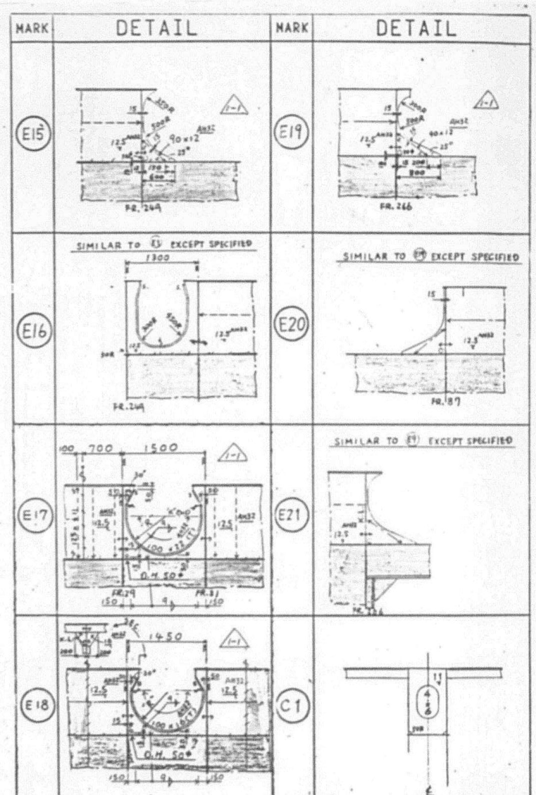
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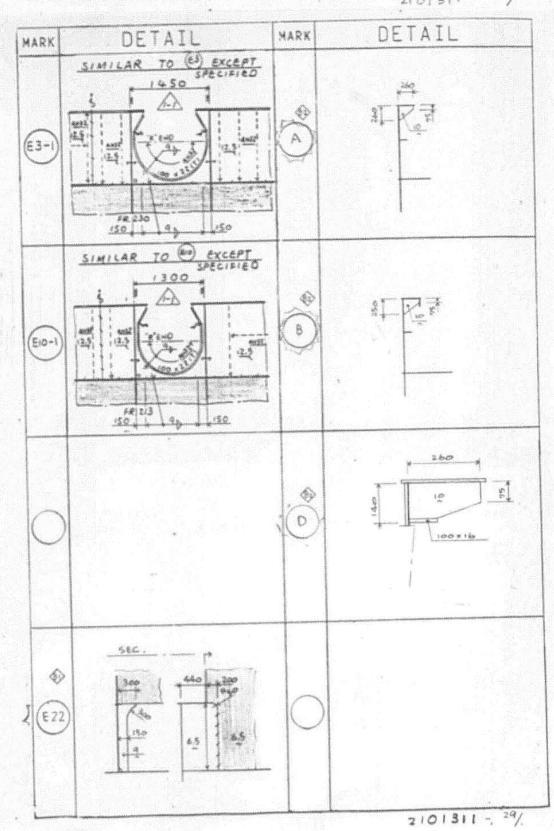
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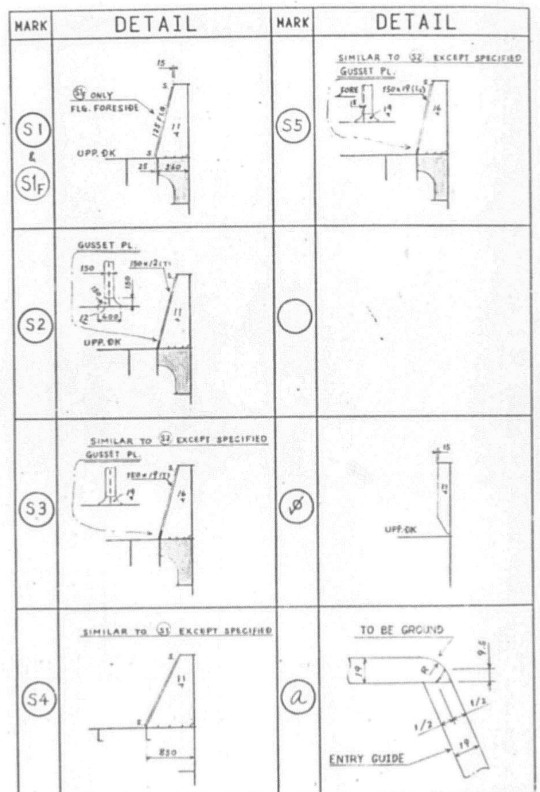
2101311 - 27/



2101311- 28/



2101311 - 29/



2101311 - 30/30

APPROVAL OF OWNER & REGULATORY BODIES								
ALT. NO.	OWNER		USCG		ABS		USPH	
	DATE	LETTER NO.	DATE	LETTER NO.	DATE	LETTER NO.	DATE	LETTER NO.
ORIGINAL	MAY 17 1985	MTL/85 do3						

FINISHEDPLAN

SHIPYARD AND SHIP'S NO. & NAME			
MITSUI TAMANO		MITSUBISHI KOBE	
NO. 1323	DOCTOR LYKES	NO. 1158	JAMES LYKES
NO. 1324	ALMERIA LYKES	NO. 1159	JOSEPH LYKES
NO. 1325	TILLIE LYKES	NO. 1164	SOLON TURMAN

MITSUI ENGINEERING & SHIPBUILDING CO., LTD.
TAMANO WORKS

SHIP'S NO. NO.1325 SHIP'S NAME TILLIE LYKES

OUTFITTING DESIGN SECTION

STRENGTH CALCULATION OF STEEL HATCH COVER

LYKES REF. NO. 160209 MITSUI DRAWING NO. 4103122

(112 SHEETS WITH COVER)

PLAN RECORD

ALT. NO.	MARK	ALTERATION/DESCRIPTION	DATE & SIGNATURE
1		PREPARED FOR S.NO. 1323 AS FINISHED PLAN, MADE APPLICABLE TO S.NO. 1324 AND S.NO. 1325.	NOVEMBER 20, 86

DWG. NO. 4103122

PLAN RECORD

1/110

SHIPYARD AND SHIP'S NO.	
MITSUI TAMANO	MITSUBISHI KOBE
NO. 1323/1324/1325	NO. 1158/1159/1164

110 SHEETS WITH COVER

SHIP DESIGNING DEPARTMENT
HULL OUTFIT DESIGNING SECT.

LYKES BROS. STEAMSHIP CO., INC. — 2,442 TEU CONTAINER SHIP

CLASS ABS

STRENGTH CALCULATION OF STEEL HATCH COVER "REFERENCE" (WEATHER DECK PONTOON TYPE)

ORDER 01-15800 01-15900 01-16400 ITEM 1100 DRAWING NO. FA-56006

MITSUBISHI HEAVY INDUSTRIES, LTD.
KOBE SHIPYARD & ENGINE WORKS

2/

INDEX

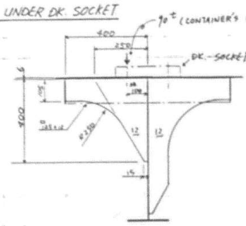
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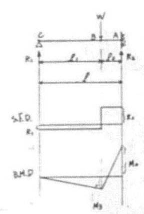
3/

1. STRENGTH CALCULATION OF THE PART UNDER DK. SOCKET AND D-RING ON H/COVER.

(THE CALCULATION IS DONE USING THE FOLLOWING MODEL AS A TYPICAL STRUCTURE OF DK. SOCKET AND D-RING.)

1.1 UNDER DK. SOCKET





$R_1 = \dfrac{W l_2^2 (2l + l_1)}{2l^3}$

$R_2 = \dfrac{W l_1 (3l^2 - l_1^2)}{2l^3}$

$M_2 = \dfrac{W l_1 l_2 (l + l_1)}{2l^2}$

$M_3 = \dfrac{-W l_1 l_2^2 (2l + l_1)}{2l^3}$

1.1.1 STRENGTH CALCULATION

1) ALLOWABLE STRESS

- BENDING … $\sigma_{ba} = \sigma_Y / S.F. = 1.92\ t/cm^2$
- SHEARING … $\tau_a = \sigma_{avg} \times 0.8 = 1.536\ t/cm^2$

σ_Y = YIELD STRESS = 2.4 t/cm^2

S.F. = SAFETY FACTOR = 1.25

年 月 日 課 係 担当者 技術資料 D

4/

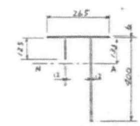
2) RESULT OF CALCULATION

- $R_1 = 7.73\ t$
- $R_2 = 82.27\ t$
- $M_2 = 590.6\ t\cdot cm$
- $M_3 = -232.0\ t\cdot cm$

∘ POINT "A"

SHEARING STRESS

$\tau_A = \dfrac{82.27}{78.9} = 1.043\ t/cm^2 < \tau_a$



BENDING STRESS

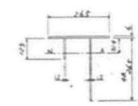
$\sigma_{bA} = \dfrac{590.6}{465.7} = 1.268\ t/cm^2 < \sigma_{ba}$

A = 78.9 cm^2
Z = 465.7 cm^3

∘ POINT "B"

SHEARING STRESS

$\tau_B = \dfrac{82.27}{62.7} = 1.312\ t/cm^2 < \tau_a$



BENDING STRESS

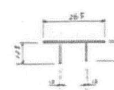
$\sigma_{bB} = \dfrac{232}{221.9} = 1.046\ t/cm^2 < \sigma_{ba}$

A = 62.7 cm^2
Z = 221.9 cm^3

∘ POINT "C"

SHEARING STRESS

$\tau_C = \dfrac{7.73}{43.5} = 0.178\ t/cm^2 < \tau_a$

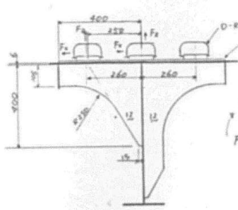


A = 43.5 cm^2

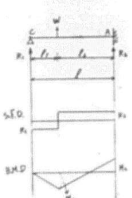
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1.2 UNDER D-RING



$F_Z = 14.1\ t$
$F_X = 10.9\ t$
FORCE OF ACTING ON D-RING



$R_1 = \dfrac{-W l_2^2 (2l + l_1)}{2l^3}$

$R_2 = \dfrac{-W l_1 (3l^2 - l_1^2)}{2l^3}$

$M_2 = \dfrac{-W l_1 l_2 (l + l_1)}{2l^2}$

$M_3 = \dfrac{W l_1 l_2^2 (2l + l_1)}{2l^3}$

1.2.1 STRENGTH CALCULATION

1) ALLOWABLE STRESS

- BENDING … $\sigma_{ba} = \sigma_Y / S.F. = 1.92\ t/cm^2$
- SHEARING … $\tau_a = \sigma_{avg} \times 0.8 = 1.536\ t/cm^2$

σ_Y = YIELD STRESS = 2.4 t/cm^2

S.F. = SAFETY FACTOR = 1.25

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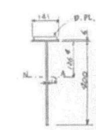
2) RESULT OF CALCULATION

- $R_1 = -7.0\ t$
- $R_2 = -7.1\ t$
- $M_2 = -86.6\ t\cdot cm$
- $M_3 = 98.0\ t\cdot cm$

∘ POINT "A"

SHEARING STRESS

$\tau_A = \dfrac{7.1}{74.0} = 0.096\ t/cm^2 < \tau_a$



BENDING STRESS

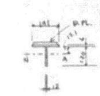
$\sigma_{bA} = \dfrac{86.6}{505.1} = 0.171\ t/cm^2 < \sigma_{ba}$

A = 74.0 cm^2
Z = 505.1 cm^3

∘ POINT "B"

SHEARING STRESS

$\tau_B = \dfrac{7.1}{40.4} = 0.176\ t/cm^2 < \tau_a$



BENDING STRESS

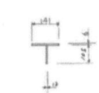
$\sigma_{bB} = \dfrac{98}{60.3} = 1.625\ t/cm^2 < \sigma_{ba}$

A = 40.4 cm^2
Z = 60.3 cm^3

∘ POINT "C"

SHEARING STRESS

$\tau_C = \dfrac{7.0}{21.1} = 0.332\ t/cm^2 < \tau_a$



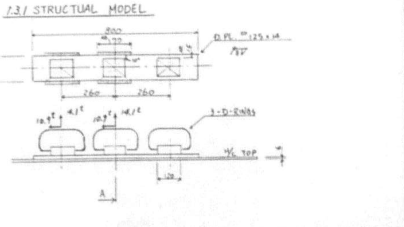
A = 21.1 cm^2

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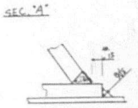
1.3 STRENGTH CALCULATION FOR WELDING PARTS OF D.PL. AND H/COVER'S TOP PL.

1.3.1 STRUCTURAL MODEL



PARTS ARE EFFECTIVE WELDING AREAS.

SEC. "A"



1.3.2 RESULT OF CALCULATION

1) WELDING PARTS OF D. PL.

TENSILE STRESS

$$\sigma_T = \frac{14.1}{0.8/\sqrt{2} \times 17 \times 2} = 0.733\ t/cm^2 < \sigma_a (= 1.92\ t/cm^2)$$

SHEARING STRESS

$$\tau = \frac{10.9}{0.8/\sqrt{2} \times 17 \times 2} = 0.567\ t/cm^2 < \tau_a (= 1.536\ t/cm^2)$$

EQUIVALENT STRESS

$$\sigma_e = \sqrt{\sigma_T^2 + 3\tau^2} = \sqrt{0.733^2 + 3 \times 0.567^2} = 1.225\ t/cm^2$$

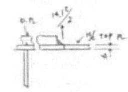
$$S.F. = \sigma_T/\sigma_e = 2.4/1.225 = 2.0 \quad (S.F. = \text{SAFETY FACTOR})$$

2) H/C's TOP PLATE

(CALCULATED AS SAME AS THE WELDING PARTS OF D. PL.)

TENSILE STRESS

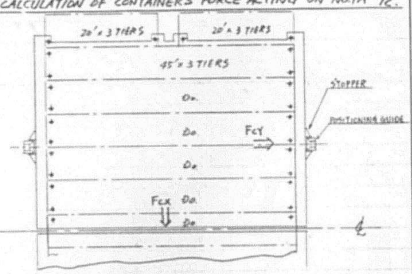
$$\sigma_T = \frac{14.1/2}{0.6 \times 17} = 0.691\ t/cm^2 < \sigma_a (= 1.92\ t/cm^2)$$



2. STRENGTH CALCULATION OF POSITIONING GUIDE & STOPPER

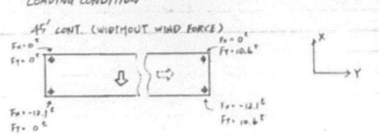
(THIS STRENGTH CALCULATION IS DONE FOR No.1A H/C ON WHICH MAXIMUM FORCE ACTS.)

2.1. CALCULATION OF CONTAINER'S FORCE ACTING ON No.1A H/C.

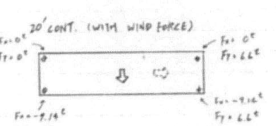


※ THIS ARRANGEMENT OF CONTAINER REPRESENTS MAXIMUM LOADING CONDITION

45' CONT. (WITHOUT WIND FORCE)



20' CONT. (WITH WIND FORCE)



2.1.1 RESULTS OF CALCULATION

$$F_{CX} = \Sigma F_X = 12.1 \times 2 \times 5 + 9.14 \times 4 = 157.56^t$$

$$F_{CY} = \Sigma F_Y = 10.6 \times 2 \times 5.5 + 6.6 \times 2 = 129.8^t$$

2.2. CALCULATION OF FORCE OWING TO H/C MASS.

2.2.1 H/COVER WEIGHT (No.1A)

$W = 29.1^t$

2.2.2 ACCELERATION (FOR TRANS. & LONGI. DIRECTION)

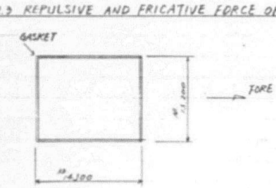
1) FOR TRANS. DIRECT.

$a_X = 0.72\,g$

2) FOR LONGI. DIRECT.

$a_Y = 0.22\,g$

2.2.3 REPULSIVE AND FRICATIVE FORCE OF GASKET



REPULSIVE FORCE OF GASKET

$R_a = C\,\ell$

FRICATIVE FORCE OF GASKET

$R_s = \mu\, C \cdot \ell'$

C : CONSTANT OF GASKET (= 0.45 t/m)

μ : MODULUS OF FRICTION BETWEEN SEAL BAR AND GASKET (= 0.3)

ℓ, ℓ' : LENGTH OF GASKET

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1) FOR TRANS. DIRECT.

$R_{ax} = 0.45 \times 14.3 \times 2 = 12.87^{t}$

$R_{sx} = 0.3 \times 0.45 \times 13.2 \times 2 = 3.56^{t}$

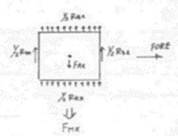
2) FOR LONGL. DIRECT.

$R_{aY} = 0.45 \times 13.2 \times 2 = 11.88^{t}$

$R_{sY} = 0.3 \times 0.45 \times 14.3 \times 2 = 3.86^{t}$

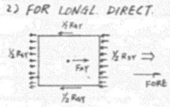
2.2.4 RESULTS OF CALCULATION

1) FOR TRANS. DIRECT.



$F_{Hx} = F_{ax} - (R_{ax} + R_{sx})$
$= W \cdot \alpha_x - (R_{ax} + R_{sx})$
$= 29.1 \times 0.72 - (12.87 + 3.56)$
$= 4.52^{t}$

2) FOR LONGL. DIRECT.



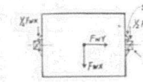
$F_{HY} = F_{aY} - (R_{aY} + R_{sY})$
$= W \cdot \alpha_Y - (R_{aY} + R_{sY})$
$= 29.1 \times 0.22 - (11.88 + 3.86)$
$= -9.34^{t}$

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2.3 CALCULATION OF FORCE ACTING ON POSITIONING GUIDE AND STOPPER

1) FOR TRANS. DIRECT.

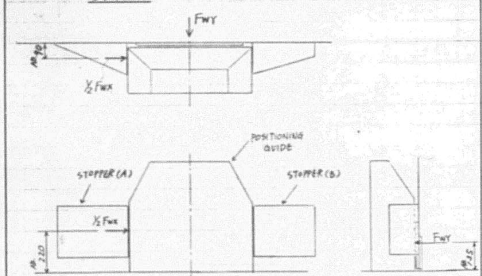
$F_{Wx} = F_{cx} + F_{Hx}$
$= 157.56 + 4.52$
$= 162.1^{t}$



2) FOR LONGL. DIRECT.

$F_{WY} = F_{cY} + F_{HY}$
$= 129.8 + (-9.34)$
$= 120.5^{t}$

2.4 STRENGTH CALCULATION OF POSITIONING GUIDE AND STOPPER



2.4.1 ALLOWABLE STRESS OF WELDING PART

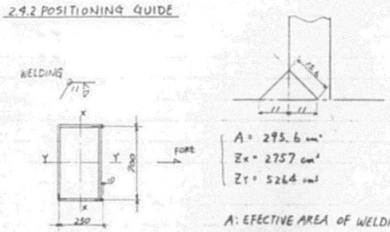
BENDING ··· $\sigma_{awg} = \sigma_Y / S.F. = 1.92\ ^t/_{cm^2}$

SHEARING ··· $\tau_{awg} = \sigma_{awg} \times 0.8 = 1.536\ ^t/_{cm^2}$

σ_Y = YIELD STRESS ($= 2.4\ ^t/_{cm^2}$) S.F. = SAFETY FACTOR ($= 1.25$)

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2.4.2 POSITIONING GUIDE



$A = 295.6\ cm^2$
$Z_X = 2757\ cm^3$
$Z_Y = 5264\ cm^3$

A: EFECTIVE AREA OF WELDING

1) FOR TRANS. DIRECT.

· SHEARING STRESS

$\tau_x = \dfrac{\frac{1}{2} F_{Wx}}{A}$

$= \dfrac{\frac{1}{2} \times 162.1}{295.6}$

$= 0.274\ ^t/_{cm^2} < \tau_{awg}$

o.k.

· BENDING STRESS

$\sigma_{bx} = \dfrac{\frac{1}{2} F_{Wx} \times 22}{Z_Y}$

$= \dfrac{\frac{1}{2} \times 162.1 \times 22}{5264}$

$= 0.339\ ^t/_{cm^2} < \sigma_{awg}$

o.k.

14/

2) FOR LONGL. DIRECT.

· SHEARING STRESS

$\tau_Y = \dfrac{F_{WY}}{A}$

$= \dfrac{120.5}{295.6}$

$= 0.408\ ^t/_{cm^2} < \tau_{awg}$

o.k.

· BENDING STRESS

$\sigma_{bY} = \dfrac{F_{WY} \times 13.5}{A}$

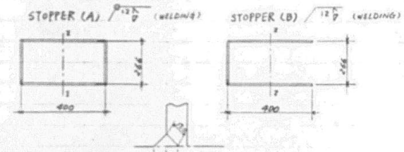
$= \dfrac{120.5 \times 13.5}{2757}$

$= 0.590\ ^t/_{cm^2} < \sigma_{awg}$

o.k.

2.4.3 STOPPER

STOPPER (A) (WELDING) STOPPER (B) (WELDING)



$A_1 = 226.0\ cm^2$
$Z_1 = 2712\ cm^3$

$A_2 = 180.9\ cm^2$
$Z_2 = 1267\ cm^3$

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· SHEARING STRESS

STOPPER (A)

$$\tau_A = \frac{\frac{1}{2} F_{wx}}{A_1} = \frac{\frac{1}{2} \times 162.1}{226} = 0.359 \text{ t/cm}^2 < \tau_{reg} \quad \text{o.k.}$$

STOPPER (B)

$$\tau_B = \frac{\frac{1}{2} F_{wx}}{A_2} = \frac{\frac{1}{2} \times 162.1}{180.9} = 0.448 \text{ t/cm}^2 < \tau_{reg} \quad \text{o.k.}$$

· BENDING STRESS

STOPPER (A)

$$\sigma_{bA} = \frac{\frac{1}{2} F_{wx} \times 9}{Z_1} = \frac{\frac{1}{2} \times 162.1 \times 9}{2712} = 0.269 \text{ t/cm}^2 < \sigma_{breg} \quad \text{o.k.}$$

STOPPER (B)

$$\sigma_{bB} = \frac{\frac{1}{2} F_{wx} \times 9}{Z_2} = \frac{\frac{1}{2} \times 162.1 \times 9}{1267} = 0.576 \text{ t/cm}^2 < \sigma_{breg} \quad \text{o.k.}$$

3. STRENGTH CALCULATION OF FASTENING BOLT

THE CALCULATION TO BE CONDUCTED TO APPRECIATE STRENGTH OF FASTENING BOLT AND QUICK-ACTING-CLEAT IN FOLLOWING TWO CASES,

(1) TO FASTEN THE HATCH COVER WHEN HATCH COVER IS THERMALLY TRANSFORMED BY SUNSHINE

(2) TO FASTEN THE HATCH COVER WHEN HATCH COAMING IS TORSIONALLY TRANSFORMED BY SHIP'S TORSIONAL TRANSFORMATION.

RESULT OF CALCULATION TO BE SHOWN ON 3.6

FASTENING BOLT AND QUICK ACTING CLEAT TO BE SHOWN ON Fig. 3.1 AND 3.2 RESPECTIVELY.

3.1 FASTENING FORCE OF FASTENING BOLT

3.1.1 PANEL TO BE CALCULATED

CALCULATION TO BE CONDUCTED ABOUT NO.S 1F AND 1A PANEL AS TYPICAL ONES (SMALLEST & LARGEST). CALCULATION MODELS TO BE SHOWN ON Fig. 3.1. CALCULATION TO BE EXECUTED BY M.H.I. "SANAS-F" (STRUCTURE ANALISYS PROGRAM BY FINITE ELEMENT METHOD).

3.1.2 PROCEDURE OF CALCULATION

i) DEFLECTION OF PANELS BY SUNSHINE TO BE CALCULATED.
ii) DEFLECTION OF PANELS BY SOME CONCENTRATED LOADS, WHICH LOADED ON THE POINT OF FASTENING BOLT, TO BE CALCULATED.
iii) FASTENING BOLT FASTENING FORCE TO BE GIVEN BY INTERPOLATION.

3.1.3 DEFLECTION OF PANEL BY SUNSHINE

DEFLECTION OF PANEL BY SUNSHINE TO BE CALCULATED BY FOLLOWING FORMULA.

$$\delta = \frac{H}{e \cdot \Delta\theta} - \sqrt{\left(\frac{H}{e \cdot \Delta\theta}\right)^2 - \left(\frac{L}{2}\right)^2}$$

where,

- δ : DEFLECTION OF PANEL (mm)
- H : DEPTH OF PANEL = 700 (mm)
- L : DISTANCE BETWEEN SUPPORT OF PANEL (mm)
- e : COEFFICIENT OF LINEAR EXPANSION = 10×10^{-6} (-)
- $\Delta\theta$: TEMPERATURE DIFFERENCE BETWEEN UPPER SURFACE AND LOWER SURFACE OF PANEL = 25 (°C)

1) PANEL - 1F

POINT - 27

$$\delta = \frac{700}{10 \times 10^{-6} \times 25} - \sqrt{\left(\frac{700}{10 \times 10^{-6} \times 25}\right)^2 - \left(\frac{9699}{2}\right)^2} = 4.20 \text{ (mm)}$$

POINT 28

$$\delta = \frac{700}{10 \times 10^{-6} \times 25} - \sqrt{\left(\frac{700}{10 \times 10^{-6} \times 25}\right)^2 - \left(\frac{12800}{2}\right)^2} = 7.31$$

POINT 29

$$\delta = \frac{700}{10 \times 10^{-6} \times 25} - \sqrt{\left(\frac{700}{10 \times 10^{-6} \times 25}\right)^2 - \left(\frac{11985}{2}\right)^2} = 6.41$$

POINT 30

$$\delta = \frac{700}{10 \times 10^{-6} \times 25} - \sqrt{\left(\frac{700}{10 \times 10^{-6} \times 25}\right)^2 - \left(\frac{9699}{2}\right)^2} = 4.20$$

2) PANEL - 1A

POINT 35

$$\delta = \frac{700}{10 \times 10^{-6} \times 25} - \sqrt{\left(\frac{700}{10 \times 10^{-6} \times 25}\right)^2 - \left(\frac{12249}{2}\right)^2} = 6.70$$

POINT 36

$$\delta = \frac{700}{10 \times 10^{-6} \times 25} - \sqrt{\left(\frac{700}{10 \times 10^{-6} \times 25}\right)^2 - \left(\frac{14320}{2}\right)^2} = 9.15$$

POINT 37

$$\delta = \frac{700}{10 \times 10^{-6} \times 25} - \sqrt{\left(\frac{700}{10 \times 10^{-6} \times 25}\right)^2 - \left(\frac{13509}{2}\right)^2} = 8.15$$

POINT 38

$$\delta = \frac{700}{10 \times 10^{-6} \times 25} - \sqrt{\left(\frac{700}{10 \times 10^{-6} \times 25}\right)^2 - \left(\frac{12249}{2}\right)^2} = 6.70$$

3.1.4 DEFLECTION of PANEL BY CONCENTRATED LOAD

CASE - 1
5 TON / 10 TON CONCENTRATED LOAD TO BE LOADED ON THE POINT OF EACH FASTENING BOLT INDEPENDENTLY.

CASE - 2
5 TON / 10 TON CONCENTRATED LOAD TO BE LOADED ON ALL POINTS OF FASTENING BOLT SIMULTANEOUSLY.

RESULTS OF CALCULATION TO BE SHOWN ON TABLES 3.1 ~ 3.20.

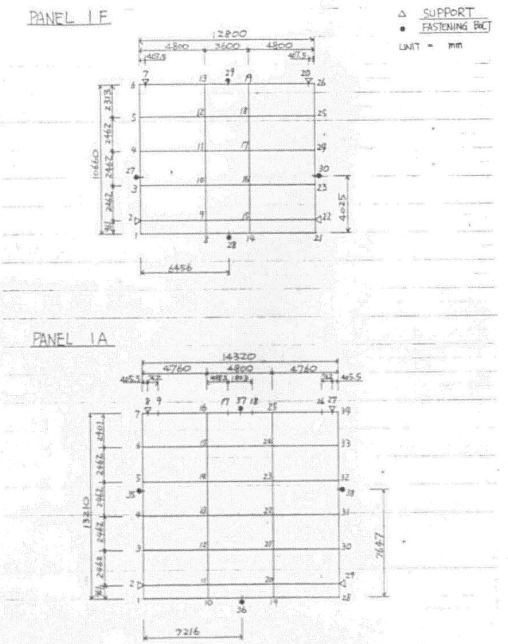
3.1.5 FASTENING BOLT FASTENING FORCE

FASTENING BOLT FASTENING FORCE TO BE GIVEN BY INTERPOLATION AS SHOWN ON FIGS. 3.2 ~ 3.3. RESULTS TO BE AS FOLLOWS.

	INDEPENDENT (TON)	SIMULTANEOUS (TON)	LARGER (TON)
PANEL - 1F			
POINT · 27	9.32	6.92	9.32
POINT · 28	7.80	8.53	8.53
POINT · 29	6.95	6.98	6.98
POINT · 30	9.32	6.92	9.32
PANEL - 1A			
POINT · 35	6.30	4.68	6.30
POINT · 36	7.07	6.45	7.07
POINT · 37	5.87	4.78	5.87
POINT · 38	6.30	4.68	6.30

MAX. = 9.32 TON

Fig 3.1 CALCULATION MODEL OF PANEL



NOTE:
DETAIL OF MEMBER PROPERTIES TO BE SHOWN ON ANOTHER DRAWINGS, "STRENGTH CALCULATION OF STEEL HATCH COVER (DWG NO. FA-56003)".

Fig 3.2 FASTENING BOLT FASTENING FORCE FOR PANEL - 1F

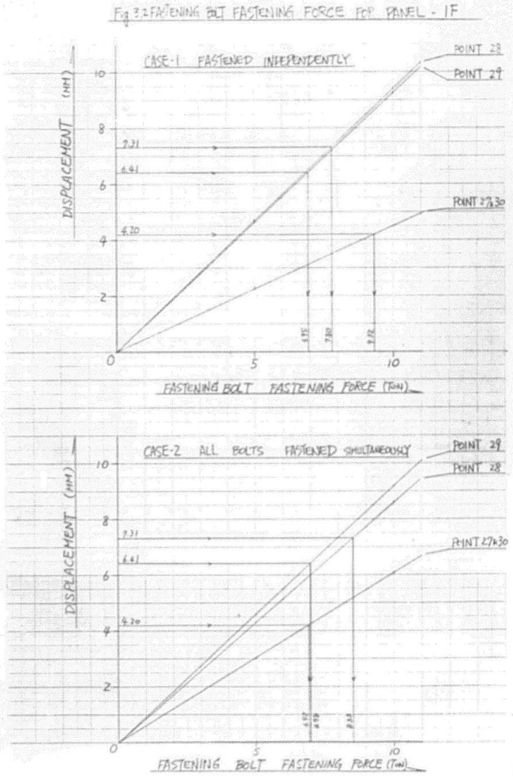
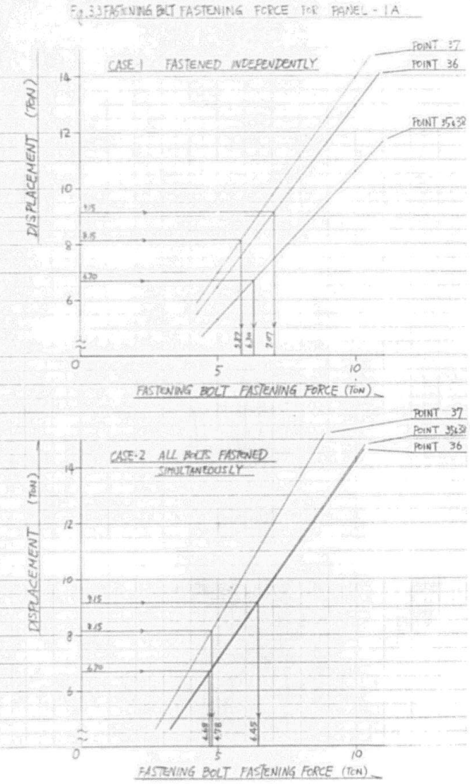


Fig 3.3 FASTENING BOLT FASTENING FORCE FOR PANEL - 1A



NO. 1 (F) STEEL HATCH COVER — CONCENTRATED LOAD (FASTENING FORCE 5 TON)

DBA1 + LYK1 , CLA1 (PAGE 1)

***** EXTERNAL JOINT DISPLACEMENTS *****

TABLE 3.1

SJOI. GROUP	SUPPORT	JOINT	X-DISP.	Y-DISP.	Z-DISP. (cm)	X-ROTATION (rad.)	Y-ROTATION (rad.)	Z-ROTATION
		1	0.0	0.0	0.08661346	-0.00089990	0.00029903	0.0
	(001000)	2	0.0	0.0	0.0	-0.00090406	0.00011812	0.0
		3	0.0	0.0	-0.19617654	-0.00057163	-0.00029142	0.0
		4	0.0	0.0	-0.24184975	0.00016038	-0.00036878	0.0
		5	0.0	0.0	-0.14570682	0.00057203	-0.00014803	0.0
		6	0.0	0.0	0.00586109	0.00069691	0.00014239	0.0
	(001000)	7	0.0	0.0	0.0	0.0	0.00014673	0.0
		8	0.0	0.0	-0.02840329	-0.00014324	0.00012080	0.0
		9	0.0	0.0	-0.04208287	-0.00014067	0.00002720	0.0
		10	0.0	0.0	-0.07250115	-0.00009566	-0.00019058	0.0
		11	0.0	0.0	-0.08556719	-0.00000656	-0.00023972	0.0
		12	0.0	0.0	-0.07682915	0.00006914	-0.00013449	0.0
		13	0.0	0.0	-0.05717358	0.00009303	0.00005022	0.0
		14	0.0	0.0	-0.03811600	0.00003339	-0.00003173	0.0
		15	0.0	0.0	-0.03494002	0.00003241	-0.00005609	0.0
		16	0.0	0.0	-0.02857627	0.00001514	-0.00010361	0.0
		17	0.0	0.0	-0.02874613	-0.00001751	-0.00013321	0.0
		18	0.0	0.0	-0.03666833	-0.00004371	-0.00011733	0.0
		19	0.0	0.0	-0.04799692	-0.00005165	-0.00008205	0.0
	(001000)	20	0.0	0.0	0.0	0.0	-0.00012547	0.0
		21	0.0	0.0	-0.00669908	0.00007010	-0.00008231	0.0
	(001000)	22	0.0	0.0	0.0	0.00006892	-0.00008120	0.0
		23	0.0	0.0	0.01497724	0.00004769	-0.00008426	0.0
		24	0.0	0.0	0.02150207	0.00000233	-0.00009033	0.0
		25	0.0	0.0	0.01640885	-0.00003955	-0.00010718	0.0
		26	0.0	0.0	0.00512608	-0.00005339	-0.00012595	0.0
FASTENING BOLT →		27	0.0	0.0	-0.22507515	-0.00038075	0.0	0.0
		28	0.0	0.0	-0.03948388	0.0	0.00002062	0.0
		29	0.0	0.0	-0.05767319	0.0	-0.00003735	0.0
		30	0.0	0.0	0.01756948	0.00003825	0.0	0.0

NO. 1 (F) STEEL HATCH COVER — CONCENTRATED LOAD (FASTENING FORCE 10 TON)

DBA2 + LYK1 , CLA2 (PAGE 18)

***** EXTERNAL JOINT DISPLACEMENTS *****

TABLE 3.2

SJOI. GROUP	SUPPORT	JOINT	X-DISP.	Y-DISP.	Z-DISP. (cm)	X-ROTATION (rad.)	Y-ROTATION (rad.)	Z-ROTATION
		1	0.0	0.0	0.17322691	-0.00179979	0.00059805	0.0
	(001000)	2	0.0	0.0	0.0	-0.00180813	0.00023624	0.0
		3	0.0	0.0	-0.39235309	-0.00114326	-0.00058284	0.0
		4	0.0	0.0	-0.48369950	0.00032075	-0.00073757	0.0
		5	0.0	0.0	-0.29141364	0.00114406	-0.00029606	0.0
		6	0.0	0.0	0.01172217	0.00139382	0.00028477	0.0
	(001000)	7	0.0	0.0	0.0	0.0	0.00029346	0.0
		8	0.0	0.0	-0.05680659	-0.00028649	0.00024161	0.0
		9	0.0	0.0	-0.08416573	-0.00028134	0.00005439	0.0
		10	0.0	0.0	-0.14500230	-0.00019132	-0.00038117	0.0
		11	0.0	0.0	-0.17113439	-0.00001311	-0.00047943	0.0
		12	0.0	0.0	-0.15365831	0.00013828	-0.00026898	0.0
		13	0.0	0.0	-0.11434716	0.00018606	0.00010043	0.0
		14	0.0	0.0	-0.07623201	0.00006678	-0.00006346	0.0
		15	0.0	0.0	-0.06988004	0.00006482	-0.00011218	0.0
		16	0.0	0.0	-0.05715253	0.00003028	-0.00020721	0.0
		17	0.0	0.0	-0.05749226	-0.00003502	-0.00026642	0.0
		18	0.0	0.0	-0.07333666	-0.00008742	-0.00023466	0.0
		19	0.0	0.0	-0.09599384	-0.00010331	-0.00016410	0.0
	(001000)	20	0.0	0.0	0.0	0.0	-0.00025094	0.0
		21	0.0	0.0	-0.01339815	0.00014021	-0.00016462	0.0
	(001000)	22	0.0	0.0	0.0	0.00013784	-0.00016240	0.0
		23	0.0	0.0	0.02995448	0.00009538	-0.00016852	0.0
		24	0.0	0.0	0.04300414	0.00000466	-0.00018067	0.0
		25	0.0	0.0	0.03281770	-0.00007911	-0.00021435	0.0
		26	0.0	0.0	0.01025216	-0.00010678	-0.00025191	0.0
FASTENING BOLT →		27	0.0	0.0	-0.45015029	-0.00076150	0.0	0.0
		28	0.0	0.0	-0.07896775	0.0	0.00004124	0.0
		29	0.0	0.0	-0.11534639	0.0	-0.00007469	0.0
		30	0.0	0.0	0.03513897	0.00007651	0.0	0.0

NO. 1 (F) STEEL HATCH COVER — CONCENTRATED LOAD (FASTENING FORCE 5 TON)

DBB1 + LYK1 , CLB1 (PAGE 52)

***** EXTERNAL JOINT DISPLACEMENTS *****

TABLE 3.3

SJOI. GROUP	SUPPORT	JOINT	X-DISP.	Y-DISP.	Z-DISP. (cm)	X-ROTATION (rad.)	Y-ROTATION (rad.)	Z-ROTATION
		1	0.0	0.0	0.01233536	-0.00012440	0.00106739	0.0
	(001000)	2	0.0	0.0	0.0	-0.00013627	0.00093044	0.0
		3	0.0	0.0	-0.03378879	-0.00010876	0.00047808	0.0
		4	0.0	0.0	-0.04634042	0.00000664	0.00012901	0.0
		5	0.0	0.0	-0.03386963	0.00008120	-0.00012083	0.0
		6	0.0	0.0	-0.01261466	0.00009724	-0.00030975	0.0
	(001000)	7	0.0	0.0	0.0	0.0	-0.00030919	0.0
		8	0.0	0.0	-0.41880183	0.00061331	0.00055982	0.0
		9	0.0	0.0	-0.36018559	0.00060367	0.00039272	0.0
		10	0.0	0.0	-0.21880540	0.00053918	0.00020145	0.0
		11	0.0	0.0	-0.09540877	0.00046596	0.00004897	0.0
		12	0.0	0.0	0.01292866	0.00042072	-0.00005115	0.0
		13	0.0	0.0	0.10839517	0.00040868	-0.00012795	0.0
		14	0.0	0.0	-0.42066921	0.00061978	-0.00055573	0.0
		15	0.0	0.0	-0.36145265	0.00060951	-0.00038759	0.0
		16	0.0	0.0	-0.21901704	0.00054191	-0.00020072	0.0
		17	0.0	0.0	-0.09525880	0.00046646	-0.00004977	0.0
		18	0.0	0.0	0.01808043	0.00042039	0.00005042	0.0
		19	0.0	0.0	0.10844852	0.00040821	0.00012775	0.0
	(001000)	20	0.0	0.0	0.0	0.0	0.00030941	0.0
		21	0.0	0.0	0.01218006	-0.00012270	-0.00107478	0.0
	(001000)	22	0.0	0.0	0.0	-0.00013484	-0.00093699	0.0
		23	0.0	0.0	-0.03356101	-0.00010817	-0.00047982	0.0
		24	0.0	0.0	-0.04602828	0.00000665	-0.00012912	0.0
		25	0.0	0.0	-0.03365317	0.00008044	0.00012100	0.0
		26	0.0	0.0	-0.01262342	0.00009616	0.00030996	0.0
		27	0.0	0.0	-0.03948388	-0.00008046	0.0	0.0
FASTENING BOLT →		28	0.0	0.0	-0.47008174	0.0	-0.00001557	0.0
		29	0.0	0.0	0.11863854	0.0	0.00000428	0.0
		30	0.0	0.0	-0.03922326	-0.00007996	0.0	0.0

NO. 1 (F) STEEL HATCH COVER — CONCENTRATED LOAD (FASTENING FORCE 10 TON)

DBB2 + LYK1 , CLB2 (PAGE 69)

***** EXTERNAL JOINT DISPLACEMENTS *****

TABLE 3.4

SJOI. GROUP	SUPPORT	JOINT	X-DISP.	Y-DISP.	Z-DISP. (cm)	X-ROTATION (rad.)	Y-ROTATION (rad.)	Z-ROTATION
		1	0.0	0.0	0.02467071	-0.00024881	0.00213478	0.0
	(001000)	2	0.0	0.0	0.0	-0.00027255	0.00186088	0.0
		3	0.0	0.0	-0.06757758	-0.00021752	0.00095616	0.0
		4	0.0	0.0	-0.09268084	0.00001329	0.00025803	0.0
		5	0.0	0.0	-0.06773925	0.00016239	-0.00024166	0.0
		6	0.0	0.0	-0.02522933	0.00019448	-0.00061950	0.0
	(001000)	7	0.0	0.0	0.0	0.0	-0.00061838	0.0
		8	0.0	0.0	-0.83760367	0.00122662	0.00111965	0.0
		9	0.0	0.0	-0.72037118	0.00120734	0.00078544	0.0
		10	0.0	0.0	-0.43761081	0.00107837	0.00040290	0.0
		11	0.0	0.0	-0.19081753	0.00093192	0.00009794	0.0
		12	0.0	0.0	0.02585732	0.00084144	-0.00010230	0.0
		13	0.0	0.0	0.21679033	0.00081737	-0.00025590	0.0
		14	0.0	0.0	-0.84133841	0.00123955	-0.00111147	0.0
		15	0.0	0.0	-0.72290529	0.00121902	-0.00077519	0.0
		16	0.0	0.0	-0.43803407	0.00108383	-0.00040145	0.0
		17	0.0	0.0	-0.19051760	0.00093293	-0.00009953	0.0
		18	0.0	0.0	0.03616086	0.00084079	0.00010083	0.0
		19	0.0	0.0	0.21689705	0.00081641	0.00025550	0.0
	(001000)	20	0.0	0.0	0.0	0.0	0.00061882	0.0
		21	0.0	0.0	0.02436011	-0.00024540	-0.00214957	0.0
	(001000)	22	0.0	0.0	0.0	-0.00026964	-0.00187398	0.0
		23	0.0	0.0	-0.06712202	-0.00021634	-0.00095964	0.0
		24	0.0	0.0	-0.09205655	0.00001330	-0.00025824	0.0
		25	0.0	0.0	-0.06730634	0.00016088	0.00024199	0.0
		26	0.0	0.0	-0.02524684	0.00019232	0.00061992	0.0
		27	0.0	0.0	-0.07896775	-0.00016091	0.0	0.0
FASTENING BOLT →		28	0.0	0.0	-0.94016348	0.0	-0.00003113	0.0
		29	0.0	0.0	0.23727708	0.0	0.00000855	0.0
		30	0.0	0.0	-0.07844651	-0.00015992	0.0	0.0

NO. 1 (F) STEEL HATCH COVER — CONCENTRATED LOAD (FASTENING FORCE 10 TON)

DBC2 * LYK1 , CLC2 (PAGE 120)

***** EXTERNAL JOINT DISPLACEMENTS *****

SJOI. GROUP	SUPPORT	JOINT	X-DISP.	Y-DISP.	Z-DISP. (cm)	X-ROTATION (rad.)	Y-ROTATION (rad.)	Z-ROTATION
		1	0.0	0.0	0.04383245	-0.00045828	-0.00046480	0.0
	(001000)	2	0.0	0.0	0.0	-0.00045177	-0.00036623	0.0
		3	0.0	0.0	-0.09845521	-0.00031285	-0.00007515	0.0
		4	0.0	0.0	-0.13558975	0.00005098	0.00042541	0.0
		5	0.0	0.0	-0.06449439	0.00052275	0.00127078	0.0
		6	0.0	0.0	0.08976055	0.00073898	0.00220021	0.0
	(001000)	7	0.0	0.0	0.0	0.0	0.00220773	0.0
		8	0.0	0.0	0.22236229	-0.00083987	-0.00018621	0.0
		9	0.0	0.0	0.14158573	-0.00084181	-0.00015342	0.0
		10	0.0	0.0	-0.06931084	-0.00088144	-0.00003204	0.0
		11	0.0	0.0	-0.29766991	-0.00098488	0.00016324	0.0
		12	0.0	0.0	-0.55672477	-0.00111829	0.00053823	0.0
		13	0.0	0.0	-0.82478756	-0.00117960	0.00113662	0.0
		14	0.0	0.0	0.22248157	-0.00083981	0.00018557	0.0
		15	0.0	0.0	0.14171048	-0.00084176	0.00015291	0.0
		16	0.0	0.0	-0.06922126	-0.00088193	0.00003204	0.0
		17	0.0	0.0	-0.29793527	-0.00098771	-0.00016160	0.0
		18	0.0	0.0	-0.55824486	-0.00112608	-0.00053176	0.0
		19	0.0	0.0	-0.82855992	-0.00119033	-0.00112654	0.0
	(001000)	20	0.0	0.0	0.0	0.0	-0.00222518	0.0
		21	0.0	0.0	0.04410364	-0.00046111	0.00046464	0.0
	(001000)	22	0.0	0.0	0.0	-0.00045458	0.00036687	0.0
		23	0.0	0.0	-0.09910712	-0.00031519	0.00007748	0.0
		24	0.0	0.0	-0.13681475	0.00005068	-0.00042385	0.0
		25	0.0	0.0	-0.06510796	0.00052676	-0.00127688	0.0
		26	0.0	0.0	0.09046905	0.00074554	-0.00221757	0.0
		27	0.0	0.0	-0.11534639	-0.00024594	0.0	0.0
		28	0.0	0.0	0.23727708	0.0	0.00000611	0.0
FASTENING BOLT →		29	0.0	0.0	-0.92467322	0.0	-0.00002938	0.0
		30	0.0	0.0	-0.11613148	-0.00024800	0.0	0.0

TABLE 3.6

NO. 1 (F) STEEL HATCH COVER — CONCENTRATED LOAD (FASTENING FORCE 5 TON)

DBC1 * LYK1 , CLC1 (PAGE 103)

***** EXTERNAL JOINT DISPLACEMENTS *****

SJOI. GROUP	SUPPORT	JOINT	X-DISP.	Y-DISP.	Z-DISP. (cm)	X-ROTATION (rad.)	Y-ROTATION (rad.)	Z-ROTATION
		1	0.0	0.0	0.02191622	-0.00022914	-0.00023240	0.0
	(001000)	2	0.0	0.0	0.0	-0.00022588	-0.00018312	0.0
		3	0.0	0.0	-0.04922761	-0.00015642	-0.00003758	0.0
		4	0.0	0.0	-0.06779488	0.00002549	0.00021270	0.0
		5	0.0	0.0	-0.03224720	0.00026137	0.00063539	0.0
		6	0.0	0.0	0.04488027	0.00036949	0.00110011	0.0
	(001000)	7	0.0	0.0	0.0	0.0	0.00110386	0.0
		8	0.0	0.0	0.11118114	-0.00041994	-0.00009310	0.0
		9	0.0	0.0	0.07079287	-0.00042090	-0.00007671	0.0
		10	0.0	0.0	-0.03465542	-0.00044072	-0.00001602	0.0
		11	0.0	0.0	-0.14883495	-0.00049244	0.00008162	0.0
		12	0.0	0.0	-0.27836238	-0.00055915	0.00026911	0.0
		13	0.0	0.0	-0.41239378	-0.00058980	0.00056831	0.0
		14	0.0	0.0	0.11124078	-0.00041991	0.00009278	0.0
		15	0.0	0.0	0.07085524	-0.00042088	0.00007646	0.0
		16	0.0	0.0	-0.03461063	-0.00044096	0.00001602	0.0
		17	0.0	0.0	-0.14896764	-0.00049386	-0.00008080	0.0
		18	0.0	0.0	-0.27912243	-0.00056304	-0.00026588	0.0
		19	0.0	0.0	-0.41427996	-0.00059517	-0.00056327	0.0
	(001000)	20	0.0	0.0	0.0	0.0	-0.00111259	0.0
		21	0.0	0.0	0.02205182	-0.00023055	0.00023232	0.0
	(001000)	22	0.0	0.0	0.0	-0.00022729	0.00018344	0.0
		23	0.0	0.0	-0.04955356	-0.00015760	0.00003874	0.0
		24	0.0	0.0	-0.06830738	0.00002534	-0.00021193	0.0
		25	0.0	0.0	-0.03255398	0.00026338	-0.00063644	0.0
		26	0.0	0.0	0.04523452	0.00037277	-0.00110878	0.0
		27	0.0	0.0	-0.05767319	-0.00012297	0.0	0.0
		28	0.0	0.0	0.11863854	0.0	0.00000305	0.0
FASTENING BOLT →		29	0.0	0.0	-0.48233661	0.0	-0.00001469	0.0
		30	0.0	0.0	-0.05806574	-0.00012400	0.0	0.0

TABLE 3.5

NO. 1 (F) STEEL HATCH COVER — CONCENTRATED LOAD (FASTENING FORCE 10 TON)

DBD2 * LYK1 , CLD2 (PAGE 171)

***** EXTERNAL JOINT DISPLACEMENTS *****

SJOI. GROUP	SUPPORT	JOINT	X-DISP.	Y-DISP.	Z-DISP.	X-ROTATION	Y-ROTATION	Z-ROTATION
		1	0.0	0.0	-0.01339815	0.00014021	0.00016462	0.0
	(001000)	2	0.0	0.0	0.0	0.00013784	0.00016240	0.0
		3	0.0	0.0	0.02995448	0.00009538	0.00016852	0.0
		4	0.0	0.0	0.04300414	0.00000466	0.00018067	0.0
		5	0.0	0.0	0.03261770	-0.00007911	0.00021435	0.0
		6	0.0	0.0	0.01025216	-0.00010678	0.00025191	0.0
	(001000)	7	0.0	0.0	0.0	0.0	0.00025094	0.0
		8	0.0	0.0	-0.07623201	0.00006678	0.00006346	0.0
		9	0.0	0.0	-0.06988004	0.00006482	0.00011218	0.0
		10	0.0	0.0	-0.05715253	0.00003028	0.00020721	0.0
		11	0.0	0.0	-0.05749226	-0.00003502	0.00026642	0.0
		12	0.0	0.0	-0.07333666	-0.00008742	0.00023466	0.0
		13	0.0	0.0	-0.09599784	-0.00010331	0.00016410	0.0
		14	0.0	0.0	-0.05680659	-0.00028649	-0.00024161	0.0
		15	0.0	0.0	-0.08416573	-0.00028134	-0.00005439	0.0
		16	0.0	0.0	-0.14500230	-0.00019132	0.00038117	0.0
		17	0.0	0.0	-0.17113439	-0.00001311	0.00047943	0.0
		18	0.0	0.0	-0.15365831	0.00013828	0.00026898	0.0
		19	0.0	0.0	-0.11434716	0.00018606	-0.00010043	0.0
	(001000)	20	0.0	0.0	0.0	0.0	-0.00029346	0.0
		21	0.0	0.0	0.17322691	-0.00179979	-0.00059805	0.0
	(001000)	22	0.0	0.0	0.0	-0.00180813	-0.00023624	0.0
		23	0.0	0.0	-0.39235309	-0.00114726	0.00058284	0.0
		24	0.0	0.0	-0.48369950	0.00032075	0.00073757	0.0
		25	0.0	0.0	-0.29141364	0.00114406	0.00029606	0.0
		26	0.0	0.0	0.01172217	0.00139382	-0.00028477	0.0
		27	0.0	0.0	0.03513897	0.00007651	0.0	0.0
		28	0.0	0.0	-0.07844651	0.0	-0.00005191	0.0
		29	0.0	0.0	-0.11613148	0.0	0.00006544	0.0
FASTENING BOLT →		30	0.0	0.0	-0.45015029	-0.00076150	0.0	0.0

TABLE 3.8

NO. 1 (F) STEEL HATCH COVER — CONCENTRATED LOAD (FASTENING FORCE 5 TON)

DBD1 * LYK1 , CLD1 (PAGE 154)

***** EXTERNAL JOINT DISPLACEMENTS *****

SJOI. GROUP	SUPPORT	JOINT	X-DISP.	Y-DISP.	Z-DISP. (cm)	X-ROTATION (rad.)	Y-ROTATION (rad.)	Z-ROTATION
		1	0.0	0.0	-0.00669908	0.00007010	0.00008231	0.0
	(001000)	2	0.0	0.0	0.0	0.00006892	0.00008120	0.0
		3	0.0	0.0	0.01497724	0.00004769	0.00008426	0.0
		4	0.0	0.0	0.02150207	0.00000233	0.00009033	0.0
		5	0.0	0.0	0.01640885	-0.00003956	0.00010718	0.0
		6	0.0	0.0	0.00512608	-0.00005339	0.00012595	0.0
	(001000)	7	0.0	0.0	0.0	0.0	0.00012547	0.0
		8	0.0	0.0	-0.03811600	0.00003339	0.00003173	0.0
		9	0.0	0.0	-0.03494002	0.00003241	0.00005609	0.0
		10	0.0	0.0	-0.02857627	0.00001514	0.00010361	0.0
		11	0.0	0.0	-0.02874613	-0.00001751	0.00013321	0.0
		12	0.0	0.0	-0.03666833	-0.00004371	0.00011733	0.0
		13	0.0	0.0	-0.04799692	-0.00005165	0.00008205	0.0
		14	0.0	0.0	-0.02840329	-0.00014324	-0.00012080	0.0
		15	0.0	0.0	-0.04208287	-0.00014067	-0.00002720	0.0
		16	0.0	0.0	-0.07250115	-0.00009566	0.00019058	0.0
		17	0.0	0.0	-0.08556719	-0.00000656	0.00023972	0.0
		18	0.0	0.0	-0.07682915	0.00006914	0.00013449	0.0
		19	0.0	0.0	-0.05717358	0.00009303	-0.00005022	0.0
	(001000)	20	0.0	0.0	0.0	0.0	-0.00014673	0.0
		21	0.0	0.0	0.08661346	-0.00089990	-0.00029903	0.0
	(001000)	22	0.0	0.0	0.0	-0.00090406	-0.00011812	0.0
		23	0.0	0.0	-0.19617654	-0.00057163	0.00029142	0.0
		24	0.0	0.0	-0.24184975	0.00016038	0.00036878	0.0
		25	0.0	0.0	-0.14570682	0.00057203	0.00014803	0.0
		26	0.0	0.0	0.00586109	0.00069691	-0.00014239	0.0
		27	0.0	0.0	0.01756948	0.00003825	0.0	0.0
		28	0.0	0.0	-0.03922326	0.0	-0.00002596	0.0
		29	0.0	0.0	-0.05806574	0.0	0.00003272	0.0
FASTEARNG BOLT →		30	0.0	0.0	-0.22507515	-0.00038075	0.0	0.0

TABLE 3.7

SUPERPOSED CALCULATION

NO. 1 (F) STEEL HATCH COVER CONCENTRATED LOAD (FASTENING FORCE 10 Ton x 4)

SUP2 * (PAGE 222)

***** EXTERNAL JOINT DISPLACEMENTS *****

SJOI. GROUP	SUPPORT	JOINT	X-DISP.	Y-DISP.	Z-DISP.	X-ROTATION	Y-ROTATION	Z-ROTATION
		1	0.0	0.0	0.22833192	-0.00236668	0.00243265	0.0
	(001000)	2	0.0	0.0	0.0	-0.00239460	0.00189329	0.0
		3	0.0	0.0	-0.52843139	-0.00157825	0.00046668	0.0
		4	0.0	0.0	-0.66896596	0.00038968	0.00012654	0.0
		5	0.0	0.0	-0.39082959	0.00175009	0.00094742	0.0
		6	0.0	0.0	0.08650555	0.00222050	0.00211739	0.0
	(001000)	7	0.0	0.0	0.0	0.0	0.00213375	0.0
		8	0.0	0.0	-0.74827998	0.00016104	0.00123851	0.0
		9	0.0	0.0	-0.73283122	0.00014901	0.00079859	0.0
		10	0.0	0.0	-0.70907648	0.00003590	0.00019690	0.0
		11	0.0	0.0	-0.71711409	-0.00010109	0.00004817	0.0
		12	0.0	0.0	-0.75786242	-0.00022600	0.00040162	0.0
		13	0.0	0.0	-0.81833823	-0.00027949	0.00114525	0.0
		14	0.0	0.0	-0.75189545	0.00018003	-0.00123097	0.0
		15	0.0	0.0	-0.73524058	0.00016074	-0.00078885	0.0
		16	0.0	0.0	-0.70941016	0.00004087	-0.00019545	0.0
		17	0.0	0.0	-0.71707952	-0.00010292	-0.00004812	0.0
		18	0.0	0.0	-0.75907897	-0.00023443	-0.00039661	0.0
		19	0.0	0.0	-0.82200388	-0.00029117	-0.00113557	0.0
	(001000)	20	0.0	0.0	0.0	0.0	-0.00215075	0.0
		21	0.0	0.0	0.22829252	-0.00236609	-0.00244760	0.0
	(001000)	22	0.0	0.0	0.0	-0.00239454	-0.00190574	0.0
		23	0.0	0.0	-0.52862775	-0.00157941	-0.00046764	0.0
		24	0.0	0.0	-0.66936867	0.00038939	-0.00012520	0.0
		25	0.0	0.0	-0.39101024	0.00175258	-0.00095318	0.0
		26	0.0	0.0	0.08719654	0.00222491	-0.00213433	0.0
FASTENING BOLT →		27	0.0	0.0	-0.60932547	-0.00109184	0.0	0.0
		28	0.0	0.0	-0.86030067	0.0	-0.00003570	0.0
		29	0.0	0.0	-0.91887401	0.0	-0.00003009	0.0
		30	0.0	0.0	-0.60958933	-0.00109291	0.0	0.0

TABLE 3.10.

NO. 1 (A) STEEL HATCH COVER CONCENTRATED LOAD (FASTENING FORCE 10 TON)

DBA2 * LYK2 , CLA2 (PAGE 29)

***** EXTERNAL JOINT DISPLACEMENTS *****

SJOI. GROUP	SUPPORT	JOINT	X-DISP.	Y-DISP.	Z-DISP. (cm)	X-ROTATION (rad.)	Y-ROTATION (rad.)	Z-ROTATION
		1	0.0	0.0	0.23340659	-0.00242460	0.00095401	0.0
	(001000)	2	0.0	0.0	0.0	-0.00243717	0.00052106	0.0
		3	0.0	0.0	-0.57719896	-0.00212672	-0.00052286	0.0
		4	0.0	0.0	-0.98440860	-0.00105116	-0.00130749	0.0
		5	0.0	0.0	-1.01795267	0.00088994	-0.00136273	0.0
		6	0.0	0.0	-0.60257599	0.00232221	-0.00047216	0.0
		7	0.0	0.0	0.02881432	0.00278343	0.00070537	0.0
	(001000)	8	0.0	0.0	0.0	0.0	0.00072105	0.0
		9	0.0	0.0	-0.05660161	0.0	0.00075684	0.0
		10	0.0	0.0	-0.13969564	-0.00061337	0.00044346	0.0
		11	0.0	0.0	-0.19835309	-0.00060478	0.00020658	0.0
		12	0.0	0.0	-0.33533587	-0.00048366	-0.00047849	0.0
		13	0.0	0.0	-0.42516328	-0.00022115	-0.00090871	0.0
		14	0.0	0.0	-0.43866421	0.00010918	-0.00092426	0.0
		15	0.0	0.0	-0.37849998	0.00035544	-0.00046791	0.0
		16	0.0	0.0	-0.27761095	0.00045654	0.00030209	0.0
		17	0.0	0.0	-0.29538433	0.0	-0.00004623	0.0
		18	0.0	0.0	-0.26019584	0.0	-0.00031711	0.0
		19	0.0	0.0	-0.16623713	0.00013420	-0.00020619	0.0
		20	0.0	0.0	-0.15341855	0.00013187	-0.00028259	0.0
		21	0.0	0.0	-0.12448151	0.00009559	-0.00040571	0.0
		22	0.0	0.0	-0.11009265	0.00001272	-0.00049275	0.0
		23	0.0	0.0	-0.12035167	-0.00009815	-0.00050404	0.0
		24	0.0	0.0	-0.15527113	-0.00017945	-0.00046495	0.0
		25	0.0	0.0	-0.20364172	-0.00021381	-0.00041905	0.0
		26	0.0	0.0	-0.03774344	0.0	-0.00049209	0.0
	(001000)	27	0.0	0.0	0.0	0.0	-0.00049799	0.0
		28	0.0	0.0	-0.02567305	0.00026825	-0.00033984	0.0
	(001000)	29	0.0	0.0	0.0	0.00026495	-0.00034203	0.0
		30	0.0	0.0	0.05986110	0.00020794	-0.00037810	0.0
		31	0.0	0.0	0.08658690	0.00008020	-0.00040503	0.0
		32	0.0	0.0	0.09764850	-0.00006828	-0.00043505	0.0
		33	0.0	0.0	0.08668162	-0.00017147	-0.00046695	0.0
		34	0.0	0.0	0.02022391	-0.00020451	-0.00049911	0.0
FASTENING BOLT →		35	0.0	0.0	-1.05993195	0.00029196	0.0	0.0
		36	0.0	0.0	-0.19205614	0.0	0.00001610	0.0
		37	0.0	0.0	-0.28274093	0.0	-0.00021025	0.0
		38	0.0	0.0	0.10103033	-0.00002807	0.0	0.0

TABLE 3.12.

SUPERPOSED CALCULATION

NO. 1 (F) STEEL HATCH COVER CONCENTRATED LOAD (FASTENING FORCE 5 Ton x 4)

SUP1 * (PAGE 205)

***** EXTERNAL JOINT DISPLACEMENTS *****

SJOI. GROUP	SUPPORT	JOINT	X-DISP.	Y-DISP.	Z-DISP.	X-ROTATION	Y-ROTATION	Z-ROTATION
		1	0.0	0.0	0.11416596	-0.00118334	0.00121633	0.0
	(001000)	2	0.0	0.0	0.0	-0.00119730	0.00094664	0.0
		3	0.0	0.0	-0.26421570	-0.00078912	0.00023334	0.0
		4	0.0	0.0	-0.33448298	0.00019484	0.00006327	0.0
		5	0.0	0.0	-0.19541480	0.00087504	0.00047371	0.0
		6	0.0	0.0	0.04325277	0.00111025	0.00105870	0.0
	(001000)	7	0.0	0.0	0.0	0.0	0.00106688	0.0
		8	0.0	0.0	-0.37413999	0.00008352	0.00061925	0.0
		9	0.0	0.0	-0.36641561	0.00007451	0.00039930	0.0
		10	0.0	0.0	-0.35453824	0.00001795	0.00009845	0.0
		11	0.0	0.0	-0.35855704	-0.00005055	0.00002408	0.0
		12	0.0	0.0	-0.37893121	-0.00011300	0.00020081	0.0
		13	0.0	0.0	-0.40916911	-0.00013974	0.00057263	0.0
		14	0.0	0.0	-0.37594772	0.00009002	-0.00061548	0.0
		15	0.0	0.0	-0.36762029	0.00008037	-0.00039442	0.0
		16	0.0	0.0	-0.35470508	0.00002043	-0.00009772	0.0
		17	0.0	0.0	-0.35853976	-0.00005146	-0.00002406	0.0
		18	0.0	0.0	-0.37953949	-0.00011721	-0.00019831	0.0
		19	0.0	0.0	-0.41100194	-0.00014559	-0.00056779	0.0
	(001000)	20	0.0	0.0	0.0	0.0	-0.00107538	0.0
		21	0.0	0.0	0.11414626	-0.00118305	-0.00122380	0.0
	(001000)	22	0.0	0.0	0.0	-0.00119727	-0.00095287	0.0
		23	0.0	0.0	-0.26431387	-0.00078970	-0.00023392	0.0
		24	0.0	0.0	-0.33468333	0.00019470	-0.00006260	0.0
		25	0.0	0.0	-0.19550512	0.00087629	-0.00047659	0.0
		26	0.0	0.0	0.04359827	0.00111245	-0.00106716	0.0
FASTENING BOLT →		27	0.0	0.0	-0.30466273	-0.00054592	0.0	0.0
		28	0.0	0.0	-0.43015034	0.0	-0.00001785	0.0
		29	0.0	0.0	-0.45943701	0.0	-0.00001505	0.0
		30	0.0	0.0	-0.30479466	-0.00054645	0.0	0.0

TABLE 3.9.

NO. 1 (A) STEEL HATCH COVER CONCENTRATED LOAD (FASTENING FORCE 5 TON)

DBA1 * LYK2 , CLA1 (PAGE 1)

***** EXTERNAL JOINT DISPLACEMENTS *****

SJOI. GROUP	SUPPORT	JOINT	X-DISP.	Y-DISP.	Z-DISP. (cm)	X-ROTATION (rad.)	Y-ROTATION (rad.)	Z-ROTATION
		1	0.0	0.0	0.11670330	-0.00121230	0.00047701	0.0
	(001000)	2	0.0	0.0	0.0	-0.00121859	0.00026053	0.0
		3	0.0	0.0	-0.28859948	-0.00106336	-0.00026143	0.0
		4	0.0	0.0	-0.49220430	-0.00052558	-0.00065375	0.0
		5	0.0	0.0	-0.50897634	0.00044497	-0.00068137	0.0
		6	0.0	0.0	-0.30128799	0.00116111	-0.00023608	0.0
		7	0.0	0.0	0.01440716	0.00139171	0.00035268	0.0
	(001000)	8	0.0	0.0	0.0	0.0	0.00036052	0.0
		9	0.0	0.0	-0.02830081	0.0	0.00037842	0.0
		10	0.0	0.0	-0.06984782	-0.00030668	0.00022173	0.0
		11	0.0	0.0	-0.09917655	-0.00030239	0.00010329	0.0
		12	0.0	0.0	-0.16766794	-0.00024183	-0.00023925	0.0
		13	0.0	0.0	-0.21258164	-0.00011057	-0.00045435	0.0
		14	0.0	0.0	-0.21933211	0.00005459	-0.00046213	0.0
		15	0.0	0.0	-0.18924999	0.00017772	-0.00023396	0.0
		16	0.0	0.0	-0.13880548	0.00022827	0.00015105	0.0
		17	0.0	0.0	-0.14769217	0.0	-0.00002312	0.0
		18	0.0	0.0	-0.13009792	0.0	-0.00015856	0.0
		19	0.0	0.0	-0.08311857	0.00006710	-0.00010309	0.0
		20	0.0	0.0	-0.07670927	0.00006593	-0.00014130	0.0
		21	0.0	0.0	-0.06224076	0.00004779	-0.00020286	0.0
		22	0.0	0.0	-0.05504633	0.00000636	-0.00024637	0.0
		23	0.0	0.0	-0.06017583	-0.00004907	-0.00025202	0.0
		24	0.0	0.0	-0.07763556	-0.00008972	-0.00023248	0.0
		25	0.0	0.0	-0.10182086	-0.00010691	-0.00020953	0.0
		26	0.0	0.0	-0.01887172	0.0	-0.00024605	0.0
	(001000)	27	0.0	0.0	0.0	0.0	-0.00024900	0.0
		28	0.0	0.0	-0.01283652	0.00013412	-0.00016993	0.0
	(001000)	29	0.0	0.0	0.0	0.00013248	-0.00017102	0.0
		30	0.0	0.0	0.02993055	0.00010397	-0.00018905	0.0
		31	0.0	0.0	0.04329345	0.00004010	-0.00020252	0.0
		32	0.0	0.0	0.04882425	-0.00003414	-0.00021753	0.0
		33	0.0	0.0	0.03334081	-0.00008573	-0.00023348	0.0
		34	0.0	0.0	0.01011196	-0.00010225	-0.00024956	0.0
FASTENING BOLT →		35	0.0	0.0	-0.52996597	0.00014598	0.0	0.0
		36	0.0	0.0	-0.09602807	0.0	0.00000805	0.0
		37	0.0	0.0	-0.14137046	0.0	-0.00010512	0.0
		38	0.0	0.0	0.05051516	-0.00001404	0.0	0.0

TABLE 3.11

TABLE 3.13

NO. 1 (A) STEEL HATCH COVER — CONCENTRATED LOAD (FASTENING FORCE 5 TON)

DBB1 * LYK2 , CLB1 (PAGE 85)

***** EXTERNAL JOINT DISPLACEMENTS *****

$JOI. GROUP	SUPPORT	JOINT	X-DISP.	Y-DISP.	Z-DISP. (cm)	X-ROTATION (rad.)	Y-ROTATION (rad.)	Z-ROTATION
		1	0.0	0.0	0.02879816	-0.00027560	0.00128054	0.0
	(001000)	2	0.0	0.0	0.0	-0.00028537	0.00112187	0.0
		3	0.0	0.0	-0.06717079	-0.00022274	0.00061121	0.0
		4	0.0	0.0	-0.09977526	-0.00003945	0.00021460	0.0
		5	0.0	0.0	-0.08965977	0.00010649	-0.00003429	0.0
		6	0.0	0.0	-0.05422442	0.00016851	-0.00017957	0.0
		7	0.0	0.0	-0.01193350	0.00017995	-0.00029442	0.0
	(001000)	8	0.0	0.0	0.0	0.0	-0.00029403	0.0
		9	0.0	0.0	0.02224567	0.0	-0.00028848	0.0
		10	0.0	0.0	-0.51984244	0.00065065	0.00088414	0.0
		11	0.0	0.0	-0.45778840	0.00063648	0.00063931	0.0
		12	0.0	0.0	-0.31021730	0.00055812	0.00030844	0.0
		13	0.0	0.0	-0.18360480	0.00047167	0.00009887	0.0
		14	0.0	0.0	-0.07625032	0.00040613	-0.00001588	0.0
		15	0.0	0.0	0.01903117	0.00037271	-0.00010231	0.0
		16	0.0	0.0	0.10683158	0.00036174	-0.00015212	0.0
		17	0.0	0.0	0.12252188	0.0	-0.00005728	0.0
		18	0.0	0.0	0.12265242	0.0	0.00005696	0.0
		19	0.0	0.0	-0.52224977	0.00065764	-0.00088412	0.0
		20	0.0	0.0	-0.45954573	0.00064283	-0.00063634	0.0
		21	0.0	0.0	-0.31076102	0.00056165	-0.00030731	0.0
		22	0.0	0.0	-0.18357321	0.00047299	-0.00009898	0.0
		23	0.0	0.0	-0.07606266	0.00040625	0.00001535	0.0
		24	0.0	0.0	0.01918638	0.00037240	0.00010195	0.0
		25	0.0	0.0	0.10689645	0.00036133	0.00015201	0.0
		26	0.0	0.0	0.02226429	0.0	0.00028873	0.0
	(001000)	27	0.0	0.0	0.0	0.0	0.00029427	0.0
		28	0.0	0.0	0.02677017	-0.00027525	-0.00128804	0.0
	(001000)	29	0.0	0.0	0.0	-0.00028520	-0.00112887	0.0
		30	0.0	0.0	-0.06717834	-0.00022269	-0.00061346	0.0
		31	0.0	0.0	-0.09971092	-0.00003902	-0.00021464	0.0
		32	0.0	0.0	-0.08951115	0.00010665	0.00003467	0.0
		33	0.0	0.0	-0.05410402	0.00016813	0.00017986	0.0
		34	0.0	0.0	-0.01194277	0.00017933	0.00029465	0.0
		35	0.0	0.0	-0.09602807	0.00007423	0.0	0.0
FASTENING BOLT →		36	0.0	0.0	-0.64633023	0.0	-0.00001872	0.0
		37	0.0	0.0	0.12510285	0.0	0.00000337	0.0
		38	0.0	0.0	-0.09589568	0.00007453	0.0	0.0

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TABLE 3.14

NO. 1 (A) STEEL HATCH COVER — CONCENTRATED LOAD (FASTENING FORCE 10 TON)

DBB2 * LYK2 , CLB2 (PAGE 113)

***** EXTERNAL JOINT DISPLACEMENTS *****

$JOI. GROUP	SUPPORT	JOINT	X-DISP.	Y-DISP.	Z-DISP. (cm)	X-ROTATION (rad.)	Y-ROTATION (rad.)	Z-ROTATION
		1	0.0	0.0	0.05359633	-0.00055121	0.00256107	0.0
	(001000)	2	0.0	0.0	0.0	-0.00057073	0.00224374	0.0
		3	0.0	0.0	-0.13424159	-0.00044548	0.00122242	0.0
		4	0.0	0.0	-0.19955052	-0.00007889	0.00042919	0.0
		5	0.0	0.0	-0.17931955	0.00021299	-0.00006858	0.0
		6	0.0	0.0	-0.10844885	0.00033702	-0.00035913	0.0
		7	0.0	0.0	-0.02386700	0.00035990	-0.00058884	0.0
	(001000)	8	0.0	0.0	0.0	0.0	-0.00058806	0.0
		9	0.0	0.0	0.04449134	0.0	-0.00057696	0.0
		10	0.0	0.0	-1.03968488	0.00130131	0.00176828	0.0
		11	0.0	0.0	-0.91557680	0.00127296	0.00127862	0.0
		12	0.0	0.0	-0.62043461	0.00111623	0.00061688	0.0
		13	0.0	0.0	-0.36720961	0.00094335	0.00019773	0.0
		14	0.0	0.0	-0.15250063	0.00081226	-0.00003177	0.0
		15	0.0	0.0	0.03806234	0.00074541	-0.00020462	0.0
		16	0.0	0.0	0.21366316	0.00072348	-0.00030424	0.0
		17	0.0	0.0	0.24504376	0.0	-0.00011456	0.0
		18	0.0	0.0	0.24810484	0.0	0.00011392	0.0
		19	0.0	0.0	-1.04449954	0.00131528	-0.00176823	0.0
		20	0.0	0.0	-0.91909145	0.00128566	-0.00127267	0.0
		21	0.0	0.0	-0.62152204	0.00112331	-0.00061462	0.0
		22	0.0	0.0	-0.36714641	0.00094597	-0.00019796	0.0
		23	0.0	0.0	-0.15212532	0.00081250	0.00003071	0.0
		24	0.0	0.0	0.03837276	0.00074480	0.00020390	0.0
		25	0.0	0.0	0.21379290	0.00072265	0.00030402	0.0
		26	0.0	0.0	0.04452959	0.0	0.00057746	0.0
	(001000)	27	0.0	0.0	0.0	0.0	0.00058853	0.0
		28	0.0	0.0	0.05354034	-0.00055050	-0.00257609	0.0
	(001000)	29	0.0	0.0	0.0	-0.00057040	-0.00225774	0.0
		30	0.0	0.0	-0.13435667	-0.00044539	-0.00122692	0.0
		31	0.0	0.0	-0.19943185	-0.00007805	-0.00042929	0.0
		32	0.0	0.0	-0.17902230	0.00021331	0.00006935	0.0
		33	0.0	0.0	-0.10820803	0.00033627	0.00035971	0.0
		34	0.0	0.0	-0.02388554	0.00035866	0.00058929	0.0
		35	0.0	0.0	-0.19205614	0.00014847	0.0	0.0
FASTENING BOLT →		36	0.0	0.0	-1.29266046	0.0	-0.00003744	0.0
		37	0.0	0.0	0.25020570	0.0	0.00000675	0.0
		38	0.0	0.0	-0.19179135	0.00014906	0.0	0.0

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TABLE 3.15

NO. 1 (A) STEEL HATCH COVER — CONCENTRATED LOAD (FASTENING FORCE 5 TON)

DBC1 * LYK2 , CLC1 (PAGE 169)

***** EXTERNAL JOINT DISPLACEMENTS *****

$JOI. GROUP	SUPPORT	JOINT	X-DISP.	Y-DISP.	Z-DISP. (cm)	X-ROTATION (rad.)	Y-ROTATION (rad.)	Z-ROTATION
		1	0.0	0.0	0.03274589	-0.00034157	-0.00020189	0.0
	(001000)	2	0.0	0.0	0.0	-0.00033910	-0.00017732	0.0
		3	0.0	0.0	-0.07863094	-0.00028627	-0.00011380	0.0
		4	0.0	0.0	-0.13276864	-0.00013362	0.00003217	0.0
		5	0.0	0.0	-0.13528667	0.00013040	0.00034593	0.0
		6	0.0	0.0	-0.06580211	0.00042801	0.00085018	0.0
		7	0.0	0.0	0.05877887	0.00056430	0.00144800	0.0
	(001000)	8	0.0	0.0	0.0	0.0	0.00145263	0.0
		9	0.0	0.0	-0.11089036	0.0	0.00145178	0.0
		10	0.0	0.0	0.11291112	-0.00042242	-0.00010146	0.0
		11	0.0	0.0	0.07228428	-0.00042339	-0.00010060	0.0
		12	0.0	0.0	-0.03339872	-0.00043818	-0.00005732	0.0
		13	0.0	0.0	-0.14534669	-0.00047619	0.00001490	0.0
		14	0.0	0.0	-0.27013278	-0.00054175	0.00015747	0.0
		15	0.0	0.0	-0.41282430	-0.00061704	0.00048557	0.0
		16	0.0	0.0	-0.56765912	-0.00066050	0.00095582	0.0
		17	0.0	0.0	-0.67605481	0.0	0.00044652	0.0
		18	0.0	0.0	-0.67772026	0.0	-0.00043320	0.0
		19	0.0	0.0	0.11299215	-0.00042274	0.00010115	0.0
		20	0.0	0.0	0.07233369	-0.00042372	0.00010051	0.0
		21	0.0	0.0	-0.03343612	-0.00043859	0.00005776	0.0
		22	0.0	0.0	-0.14553221	-0.00047706	-0.00001387	0.0
		23	0.0	0.0	-0.27067153	-0.00054296	-0.00015552	0.0
		24	0.0	0.0	-0.41417216	-0.00062155	-0.00048273	0.0
		25	0.0	0.0	-0.57033628	-0.00066662	-0.00095435	0.0
		26	0.0	0.0	-0.11162477	0.0	-0.00146128	0.0
	(001000)	27	0.0	0.0	0.0	0.0	-0.00146229	0.0
		28	0.0	0.0	0.03295234	-0.00034372	0.00020165	0.0
	(001000)	29	0.0	0.0	0.0	-0.00034125	0.00017751	0.0
		30	0.0	0.0	-0.07915032	-0.00028831	0.00011509	0.0
		31	0.0	0.0	-0.13373221	-0.00013506	-0.00003023	0.0
		32	0.0	0.0	-0.13641666	0.00013076	-0.00034504	0.0
		33	0.0	0.0	-0.06648988	0.00043139	-0.00085367	0.0
		34	0.0	0.0	0.05916892	0.00056934	-0.00145760	0.0
		35	0.0	0.0	-0.14137046	0.00004481	0.0	0.0
		36	0.0	0.0	0.12510285	0.0	0.00000219	0.0
FASTENING BOLT →		37	0.0	0.0	-0.69742274	0.0	-0.00001832	0.0
		38	0.0	0.0	-0.14250102	0.00004450	0.0	0.0

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TABLE 3.16

NO. 1 (A) STEEL HATCH COVER — CONCENTRATED LOAD (FASTENING FORCE, 10 TON)

DBC2 * LYK2 , CLC2 (PAGE 197)

***** EXTERNAL JOINT DISPLACEMENTS *****

$JOI. GROUP	SUPPORT	JOINT	X-DISP.	Y-DISP.	Z-DISP. (cm)	X-ROTATION (rad.)	Y-ROTATION (rad.)	Z-ROTATION
		1	0.0	0.0	0.06549171	-0.00068314	-0.00040378	0.0
	(001000)	2	0.0	0.0	0.0	-0.00067820	-0.00035463	0.0
		3	0.0	0.0	-0.15726188	-0.00057254	-0.00022760	0.0
		4	0.0	0.0	-0.26553736	-0.00026724	0.00006434	0.0
		5	0.0	0.0	-0.27057335	0.00026081	0.00069186	0.0
		6	0.0	0.0	-0.13160423	0.00085603	0.00170036	0.0
		7	0.0	0.0	0.11755774	0.00112859	0.00289600	0.0
	(001000)	8	0.0	0.0	0.0	0.0	0.00290526	0.0
		9	0.0	0.0	-0.22178072	0.0	0.00290357	0.0
		10	0.0	0.0	0.22582225	-0.00084483	-0.00020293	0.0
		11	0.0	0.0	0.14456856	-0.00084678	-0.00020119	0.0
		12	0.0	0.0	-0.06679344	-0.00087635	-0.00011463	0.0
		13	0.0	0.0	-0.29069338	-0.00095238	0.00002979	0.0
		14	0.0	0.0	-0.54026557	-0.00108350	0.00031495	0.0
		15	0.0	0.0	-0.82564859	-0.00123408	0.00097114	0.0
		16	0.0	0.0	-1.13531824	-0.00132100	0.00191164	0.0
		17	0.0	0.0	-1.35210963	0.0	0.00089304	0.0
		18	0.0	0.0	-1.35544052	0.0	-0.00086640	0.0
		19	0.0	0.0	0.22598430	-0.00084549	0.00020230	0.0
		20	0.0	0.0	0.14466778	-0.00084744	0.00020102	0.0
		21	0.0	0.0	-0.06687224	-0.00087719	0.00011953	0.0
		22	0.0	0.0	-0.29106441	-0.00095411	-0.00002773	0.0
		23	0.0	0.0	-0.54134306	-0.00108791	-0.00031105	0.0
		24	0.0	0.0	-0.82834431	-0.00124311	-0.00096546	0.0
		25	0.0	0.0	-1.14067655	-0.00133325	-0.00190870	0.0
		26	0.0	0.0	-0.22324954	0.0	-0.00292255	0.0
	(001000)	27	0.0	0.0	0.0	0.0	-0.00292458	0.0
		28	0.0	0.0	0.06590469	-0.00068744	0.00040330	0.0
	(001000)	29	0.0	0.0	0.0	-0.00068249	0.00035503	0.0
		30	0.0	0.0	-0.15830063	-0.00057662	0.00023017	0.0
		31	0.0	0.0	-0.26746443	-0.00027012	-0.00006047	0.0
		32	0.0	0.0	-0.27283332	0.00026152	-0.00069008	0.0
		33	0.0	0.0	-0.13297976	0.00086277	-0.00170733	0.0
		34	0.0	0.0	0.11833784	0.00113869	-0.00291520	0.0
		35	0.0	0.0	-0.28274093	0.00008963	0.0	0.0
		36	0.0	0.0	0.25020570	0.0	0.00000438	0.0
FASTENING BOLT →		37	0.0	0.0	-1.39484548	0.0	-0.00003664	0.0
		38	0.0	0.0	-0.28500205	0.00008899	0.0	0.0

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TABLE 3.17

NO. 1 (A) STEEL HATCH COVER — CONCENTRATED LOAD (FASTENING FORCE 5 TON)

DBD1 * LYK2 , CLD1 (PAGE 253)

***** EXTERNAL JOINT DISPLACEMENTS *****

SJOI. GROUP	SUPPORT	JOINT	X-DISP.	Y-DISP.	Z-DISP. (cm)	X-ROTATION (rad.)	Y-ROTATION (rad.)	Z-ROTATION
		1	0.0	0.0	-0.01283652	0.00013412	0.00016993	0.0
	(001000)	2	0.0	0.0	0.0	0.00013248	0.00017102	0.0
		3	0.0	0.0	0.02993055	0.00010397	0.00018905	0.0
		4	0.0	0.0	0.04629345	0.00004010	0.00020252	0.0
		5	0.0	0.0	0.04882425	-0.00003414	0.00021793	0.0
		6	0.0	0.0	0.03334081	-0.00008573	0.00023348	0.0
		7	0.0	0.0	0.01011196	-0.00010229	0.00024956	0.0
	(001000)	8	0.0	0.0	0.0	0.0	0.00024900	0.0
		9	0.0	0.0	-0.01887172	0.0	0.00024605	0.0
		10	0.0	0.0	-0.08311857	0.00006710	0.00010309	0.0
		11	0.0	0.0	-0.07670927	0.00006593	0.00014130	0.0
		12	0.0	0.0	-0.06224076	0.00004779	0.00020286	0.0
		13	0.0	0.0	-0.05504633	0.00000636	0.00024637	0.0
		14	0.0	0.0	-0.06017583	-0.00004807	0.00025202	0.0
		15	0.0	0.0	-0.07763556	-0.00008972	0.00023248	0.0
		16	0.0	0.0	-0.10182086	-0.00010691	0.00020953	0.0
		17	0.0	0.0	-0.13009792	0.0	0.00015856	0.0
		18	0.0	0.0	-0.14769217	0.0	0.00002312	0.0
		19	0.0	0.0	-0.06984782	-0.00030668	-0.00022173	0.0
		20	0.0	0.0	-0.09917655	-0.00030239	-0.00010329	0.0
		21	0.0	0.0	-0.16766794	-0.00024183	0.00023925	0.0
		22	0.0	0.0	-0.21258164	-0.00011057	0.00045435	0.0
		23	0.0	0.0	-0.21933211	0.00005459	0.00046213	0.0
		24	0.0	0.0	-0.18924999	0.00017772	0.00023396	0.0
		25	0.0	0.0	-0.13880548	0.00022827	-0.00015105	0.0
		26	0.0	0.0	-0.02830081	0.0	-0.00037842	0.0
	(001000)	27	0.0	0.0	0.0	0.0	-0.00036052	0.0
		28	0.0	0.0	0.11670330	-0.00121230	-0.00047701	0.0
	(001000)	29	0.0	0.0	0.0	-0.00121859	-0.00026053	0.0
		30	0.0	0.0	-0.28859948	-0.00106336	0.00026143	0.0
		31	0.0	0.0	-0.49220430	-0.00052558	0.00065375	0.0
		32	0.0	0.0	-0.50897634	0.00044497	0.00068137	0.0
		33	0.0	0.0	-0.30128799	0.00116111	0.00023608	0.0
		34	0.0	0.0	0.01440716	0.00139171	-0.00035268	0.0
		35	0.0	0.0	0.06051516	-0.00001404	0.0	0.0
		36	0.0	0.0	-0.09589568	0.0	-0.00001563	0.0
		37	0.0	0.0	-0.14250102	0.0	0.00009671	0.0
FASTENING BOLT		38	0.0	0.0	-0.52996597	0.00014598	0.0	0.0

TABLE 3.18

NO. 1 (A) STEEL HATCH COVER — CONCENTRATED LOAD (FASTENING FORCE 10 TON)

DBD2 * LYK2 , CLD2 (PAGE 281)

***** EXTERNAL JOINT DISPLACEMENTS *****

SJOI. GROUP	SUPPORT	JOINT	X-DISP.	Y-DISP.	Z-DISP. (cm)	X-ROTATION (rad.)	Y-ROTATION (rad.)	Z-ROTATION
		1	0.0	0.0	-0.02567305	0.00026825	0.00033986	0.0
	(001000)	2	0.0	0.0	0.0	0.00026495	0.00034303	0.0
		3	0.0	0.0	0.05986110	0.00020794	0.00037810	0.0
		4	0.0	0.0	0.09658690	0.00008020	0.00040503	0.0
		5	0.0	0.0	0.09764850	-0.00006828	0.00043505	0.0
		6	0.0	0.0	0.06668162	-0.00017147	0.00046695	0.0
		7	0.0	0.0	0.02022391	-0.00020451	0.00049911	0.0
	(001000)	8	0.0	0.0	0.0	0.0	0.00049799	0.0
		9	0.0	0.0	-0.03774344	0.0	0.00049209	0.0
		10	0.0	0.0	-0.16623713	0.00013420	0.00020619	0.0
		11	0.0	0.0	-0.15341855	0.00013187	0.00028259	0.0
		12	0.0	0.0	-0.12448151	0.00009559	0.00040571	0.0
		13	0.0	0.0	-0.11009265	0.00001272	0.00049275	0.0
		14	0.0	0.0	-0.12035167	-0.00009615	0.00050404	0.0
		15	0.0	0.0	-0.15527113	-0.00017945	0.00046495	0.0
		16	0.0	0.0	-0.20364172	-0.00021381	0.00041905	0.0
		17	0.0	0.0	-0.26019584	0.0	0.00031711	0.0
		18	0.0	0.0	-0.29538433	0.0	0.00004623	0.0
		19	0.0	0.0	-0.13969564	-0.00061337	-0.00044346	0.0
		20	0.0	0.0	-0.19835309	-0.00060478	-0.00020658	0.0
		21	0.0	0.0	-0.33533587	-0.00048366	0.00047849	0.0
		22	0.0	0.0	-0.42516328	-0.00022115	0.00090871	0.0
		23	0.0	0.0	-0.43866421	0.00010918	0.00092426	0.0
		24	0.0	0.0	-0.37849998	0.00035544	0.00046791	0.0
		25	0.0	0.0	-0.27761095	0.00045654	-0.00030209	0.0
		26	0.0	0.0	-0.05660161	0.0	-0.00075684	0.0
	(001000)	27	0.0	0.0	0.0	0.0	-0.00072105	0.0
		28	0.0	0.0	0.23340659	-0.00242460	-0.00095401	0.0
	(001000)	29	0.0	0.0	0.0	-0.00243717	-0.00052106	0.0
		30	0.0	0.0	-0.57719896	-0.00212672	0.00052286	0.0
		31	0.0	0.0	-0.98440860	-0.00105116	0.00130749	0.0
		32	0.0	0.0	-1.01795267	0.00088994	0.00136273	0.0
		33	0.0	0.0	-0.60257599	0.00232221	0.00047216	0.0
		34	0.0	0.0	0.02881432	0.00278343	-0.00070537	0.0
		35	0.0	0.0	0.10103032	-0.00002807	0.0	0.0
		36	0.0	0.0	-0.19179135	0.0	-0.00003126	0.0
		37	0.0	0.0	-0.28500205	0.0	0.00019342	0.0
FASTENING BOLT		38	0.0	0.0	-1.05993195	0.00029196	0.0	0.0

TABLE 3.19

SUPERPOSED CALCULATION

NO.1 (A) STEEL HATCH COVER — CONCENTRATED LOAD (FASTENING FORCE 5 Ton × 4)

SUP1 * (PAGE 337)

***** EXTERNAL JOINT DISPLACEMENTS *****

SJOI. GROUP	SUPPORT	JOINT	X-DISP.	Y-DISP.	Z-DISP. (cm)	X-ROTATION (rad.)	Y-ROTATION (rad.)	Z-ROTATION
		1	0.0	0.0	0.16341079	-0.00169535	0.00172558	0.0
	(001000)	2	0.0	0.0	0.0	-0.00171057	0.00137610	0.0
		3	0.0	0.0	-0.40447066	-0.00146840	0.00042503	0.0
		4	0.0	0.0	-0.67645479	-0.00065855	-0.00020447	0.0
		5	0.0	0.0	-0.68509853	0.00064773	-0.00015220	0.0
		6	0.0	0.0	-0.38797372	0.00167190	0.00066801	0.0
		7	0.0	0.0	0.07136448	0.00203371	0.00175582	0.0
	(001000)	8	0.0	0.0	0.0	0.0	0.00176812	0.0
		9	0.0	0.0	-0.12581722	0.0	0.00178777	0.0
		10	0.0	0.0	-0.55989770	-0.00001135	0.00110750	0.0
		11	0.0	0.0	-0.56138994	-0.00002336	0.00078330	0.0
		12	0.0	0.0	-0.57352272	-0.00007409	0.00021473	0.0
		13	0.0	0.0	-0.59657946	-0.00010873	-0.00009422	0.0
		14	0.0	0.0	-0.62589104	-0.00012911	-0.00006852	0.0
		15	0.0	0.0	-0.66067868	-0.00015634	0.00038178	0.0
		16	0.0	0.0	-0.70145387	-0.00017739	0.00116427	0.0
		17	0.0	0.0	-0.83132302	0.0	0.00052468	0.0
		18	0.0	0.0	-0.83295792	0.0	-0.00051168	0.0
		19	0.0	0.0	-0.56222401	-0.00000469	-0.00110779	0.0
		20	0.0	0.0	-0.56309766	-0.00001735	-0.00078041	0.0
		21	0.0	0.0	-0.57410584	-0.00007098	-0.00021316	0.0
		22	0.0	0.0	-0.59673338	-0.00010828	0.00009514	0.0
		23	0.0	0.0	-0.62624213	-0.00013119	0.00006994	0.0
		24	0.0	0.0	-0.66187133	-0.00016116	-0.00037930	0.0
		25	0.0	0.0	-0.70406816	-0.00018393	-0.00116291	0.0
		26	0.0	0.0	-0.13653300	0.0	-0.00179701	0.0
	(001000)	27	0.0	0.0	0.0	0.0	-0.00177754	0.0
		28	0.0	0.0	0.16358928	-0.00169715	-0.00173333	0.0
	(001000)	29	0.0	0.0	0.0	-0.00171255	-0.00138291	0.0
		30	0.0	0.0	-0.40499758	-0.00147039	-0.00042599	0.0
		31	0.0	0.0	-0.67735398	-0.00065957	0.00020635	0.0
		32	0.0	0.0	-0.68607989	0.00064824	0.00015347	0.0
		33	0.0	0.0	-0.38854108	0.00167489	-0.00067121	0.0
		34	0.0	0.0	0.07174527	0.00203814	-0.00176519	0.0
		35	0.0	0.0	-0.71684934	0.00025099	0.0	0.0
		36	0.0	0.0	-0.71315112	0.0	-0.00002411	0.0
		37	0.0	0.0	-0.85619138	0.0	-0.00002336	0.0
FASTENING BOLT		38	0.0	0.0	-0.71784751	0.00025097	0.0	0.0

TABLE 3.20

SUPERPOSED CALCULATION

NO.1 (A) STEEL HATCH COVER — CONCENTRATED LOAD (FASTENING FORCE 10 Ton × 4)

SUP2 * (PAGE 365)

***** EXTERNAL JOINT DISPLACEMENTS *****

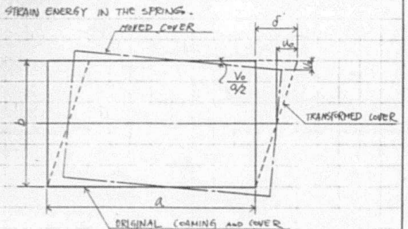
SJOI. GROUP	SUPPORT	JOINT	X-DISP.	Y-DISP.	Z-DISP. (cm)	X-ROTATION (rad.)	Y-ROTATION (rad.)	Z-ROTATION
		1	0.0	0.0	0.32682158	-0.00339070	0.00345116	0.0
	(001000)	2	0.0	0.0	0.0	-0.00342115	0.00275220	0.0
		3	0.0	0.0	-0.80894133	-0.00293680	0.00085007	0.0
		4	0.0	0.0	-1.35290957	-0.00131710	-0.00040893	0.0
		5	0.0	0.0	-1.37019706	0.00129545	-0.00030440	0.0
		6	0.0	0.0	-0.77594744	0.00334380	0.00133602	0.0
		7	0.0	0.0	0.14272897	0.00406742	0.00351164	0.0
	(001000)	8	0.0	0.0	0.0	0.0	0.00353624	0.0
		9	0.0	0.0	-0.27163443	0.0	0.00357554	0.0
		10	0.0	0.0	-1.11979541	-0.00002269	0.00221500	0.0
		11	0.0	0.0	-1.12277988	-0.00004673	0.00156660	0.0
		12	0.0	0.0	-1.14704543	-0.00014819	0.00042946	0.0
		13	0.0	0.0	-1.19315892	-0.00021746	-0.00018844	0.0
		14	0.0	0.0	-1.25178208	-0.00025822	-0.00013704	0.0
		15	0.0	0.0	-1.32135736	-0.00031268	0.00076356	0.0
		16	0.0	0.0	-1.40290774	-0.00035479	0.00232854	0.0
		17	0.0	0.0	-1.66264604	0.0	0.00104937	0.0
		18	0.0	0.0	-1.66591585	0.0	-0.00102335	0.0
		19	0.0	0.0	-1.12444802	-0.00000937	-0.00221558	0.0
		20	0.0	0.0	-1.12619531	-0.00003469	-0.00156082	0.0
		21	0.0	0.0	-1.14821167	-0.00014195	-0.00042631	0.0
		22	0.0	0.0	-1.19346676	-0.00021656	0.00019027	0.0
		23	0.0	0.0	-1.25248427	-0.00026238	0.00013989	0.0
		24	0.0	0.0	-1.32374266	-0.00032232	-0.00075860	0.0
		25	0.0	0.0	-1.40813633	-0.00036787	-0.00232583	0.0
		26	0.0	0.0	-0.27306600	0.0	-0.00359402	0.0
	(001000)	27	0.0	0.0	0.0	0.0	-0.00355509	0.0
		28	0.0	0.0	0.32717857	-0.00339430	-0.00346666	0.0
	(001000)	29	0.0	0.0	0.0	-0.00342511	-0.00276581	0.0
		30	0.0	0.0	-0.80999517	-0.00294078	-0.00085199	0.0
		31	0.0	0.0	-1.35470797	-0.00131913	0.00041271	0.0
		32	0.0	0.0	-1.37215979	0.00129648	0.00030695	0.0
		33	0.0	0.0	-0.77708215	0.00334979	-0.00134242	0.0
		34	0.0	0.0	0.14349053	0.00407627	-0.00353039	0.0
		35	0.0	0.0	-1.43369869	0.00050198	0.0	0.0
		36	0.0	0.0	-1.42630325	0.0	-0.00004822	0.0
		37	0.0	0.0	-1.71238275	0.0	-0.00004672	0.0
FASTENING BOLT		38	0.0	0.0	-1.43569502	0.00050194	0.0	0.0

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3.2 TRANSFORMATION OF HATCH COAMING, AND RELATIVE DISPLACEMENT BETWEEN HATCH COVER AND HATCH COAMING

SHIP'S TORSIONAL TRANSFORMATION MAKES RHOMBUS TRANSFORM OF HATCH OPENING, SO THAT HATCH COVER MAY BE RELATIVELY MOVED FROM HATCH COAMING. RELATIVE DISPLACEMENT BETWEEN COVER AND COAMING TO BE CALCULATED UNDER FOLLOWING ASSUMPSIONS.

i) HATCH COAMING TOP TO BE TRANSFORMED AS SAME AS OPENING.
ii) HATCH COVER TO BE RIGID
iii) GASKET BETWEEN HATCH COAMING TOP AND HATCH COVER TO BE CONSIDERED AS SPRING, AND COVER TO BE MOVED TO MINIMIZE STRAIN ENERGY IN THE SPRING.



δ': DISPLACEMENT OF HATCH COAMING PER COVER
a: COVER LENGTH
b: COVER WIDTH
U_0: RELATIVE DISPLACEMENT OF HATCH COAMING AND COVER (LONG. DIRECTION)
V_0: DITTO (TRANS. DIRECTION)

- ASPECT RATIO $\lambda = \frac{a}{b}$
- $\delta' = 2U_0 + \frac{2V_0}{a} b = 2U_0 + \frac{2V_0}{\lambda}$

$\therefore V_0 = \frac{1}{2}\lambda\delta' - U_0\lambda$ ----- ①

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- RELATIVE DISPLACEMENT ON "a" SIDE

$U_x = U_0$

$V_x = V_0 (1 - \frac{2}{a} x)$

- RELATIVE DISPLACEMENT ON "b" SIDE

$U_y = U_0 (1 - \frac{2}{b} y)$

$V_y = V_0$

- STRAIN ENERGY KEPT ON "a" SIDE

$E_a = \int_0^a k \cdot r^2$ WHERE k: SPRING CONSTANT, r: RELATIVE DISPLACEMENT AT OPTIONAL POINT

$= k \int_0^a (U_x^2 + V_x^2) dx$ $\qquad r = [U_x^2 + V_x^2]^{\frac{1}{2}}$

- STRAIN ENERGY KEPT ON "b" SIDE

$E_b = k \int_0^a (U_y^2 + V_y^2) dy$

- STRAIN ENERGY KEPT AROUND THE COVER

$$E = 2(E_a + E_b) = 2k \left[\int_0^a (U_x^2 + V_x^2) dx + \int_0^a (U_y^2 + V_y^2) dy \right]$$

$$= 2k \left[U_0^2 (a + \tfrac{1}{3} b) + V_0^2 (\tfrac{1}{3} a + b) \right]$$

$$\frac{\partial E}{\partial U_0} = 0$$

$$\therefore \frac{\partial E}{\partial U_0} = 2k \left[(a + \tfrac{1}{3} b) 2U_2 + (\tfrac{1}{3} a + b) 2V_0 \frac{\partial V_0}{\partial U_0} \right] = 0$$

REFERRING TO EQUATION ①

$$\frac{\partial E}{\partial U_0} = 2k \left[\frac{3\lambda + 1}{3} b \cdot 2U_0 + \frac{\lambda + 3}{3} b \cdot 2 \cdot (\tfrac{1}{2}\lambda\delta' - U_0\lambda)(-\lambda) \right] = 0$$

$$\therefore \frac{3\lambda + 1}{3} U_0 - \frac{\lambda^2 + 3\lambda}{3} (\tfrac{1}{2}\lambda\delta' - U_0\lambda) = 0$$

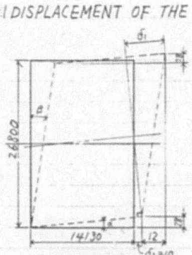
$$U_0 = \frac{\lambda^2(\lambda + 3)}{(\lambda + 1)^3} \times \frac{\delta'}{2} \quad \text{-----} ②$$

$$V_0 = \frac{\lambda(3\lambda + 1)}{(\lambda + 1)^3} \times \frac{\delta'}{2} \quad \text{-----} ③$$

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3.3 RELATION FOR TRANSFORMED HATCH COAMING AND HATCH COVER OF THIS SHIP

3.3.1 DISPLACEMENT OF THE HATCH COAMING



$\alpha = \tan^{-1} \frac{28}{14140} = 0.1135°$

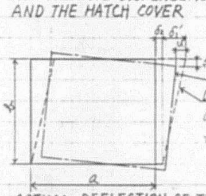
$\beta = \tan^{-1} \frac{12}{26800} = 0.0257°$

$\delta_1 = \sin(\alpha + \beta) \times 26800$

$= \sin 0.1392° \times 26800 = 65.1^{mm}$

$\delta = \delta_1 + \delta_2 = 75.1^{mm}$

3.3.2 THE RELATIVE DISPLACEMENT OF THE HATCH COAMING AND THE HATCH COVER



DISPLACEMENT OF THE COVER
DISPLACEMENT OF THE COAMING

$a = 14130$

$b = 13050$

$\lambda = \frac{14130}{13050} = 1.083$

ACTUAL DEFLECTION OF THE COAMING TOP IS ASSUMED THAT IS ABOUT 50 PERCENT ON THE UPPER DECK.

THEREFORE

$\delta_1' = 65.1 \times \frac{13050}{26800} \times 0.5 = 15.8^{mm}$ $\qquad \delta_2' = 10 \times 0.5 = 5^{mm}$

$u = \frac{\lambda^2(\lambda + 3)}{(\lambda + 1)^3} \times \frac{\delta_1'}{2} + \frac{\delta_2'}{2} = 6.7^{mm}$

$v = \frac{\lambda(3\lambda + 1)}{(\lambda + 1)^3} \times \frac{\delta_1'}{2} = 4.0^{mm}$

(REFER TO FORMALITY ② AND ③ IN 3.1)

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3.4 TIGHTENING TORQUE REQUIRED FOR FASTENING BOLT

BOLT SIZE: M42
MATERIAL: BOLT ··· CARBON STEEL (S25C)
NUT ··· STAINLESS STEEL (SUS304)

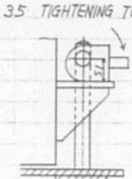
$T = \frac{d}{2} \times W \times \frac{P + \mu\pi d}{\pi d - \mu P}$

W: TENSION OF THE BOLT (max. 9.32ᵗ)
P: LEAD OF SCREW THREADS (4.5ᵐᵐ)
d: PITCH DIAMETER OF SCREW THREADS (39.077ᵐᵐ)
μ: COEFFICIENT OF FRICTION (0.15)

$\therefore T = \frac{39.077}{2} \times 9.32 \times \frac{4.5 + 0.15 \times \pi \times 39.077}{\pi \times 39.077 - 0.15 \times 4.5}$

$= 34^{t\text{-}mm} = 34^{kg\text{-}m}$

3.5 TIGHTENING TORQUE REQUIRED FOR QUICK ACTING CLEAT



μ: COEFFICIENT OF FRICTION (0.3)
W: TENSION OF THE CLEAT (max. 9.32ᵗ)

$T = 51\mu W$

$= 51 \times 0.3 \times 9.32$

$= 143^{t\text{-}mm} = 143^{kg\text{-}m}$

3.6 COMPARISON OF FASTENING BOLT AND QUICK ACTING CLEAT

3.6.1 QUANTITY OF THE DOG BOLT REQUIRED

F. B. $\quad 4^{SETS}/_{PANEL}$

Q. A. C. $\quad 20^{SETS}/_{PANEL}$ $\quad (\frac{143}{34} = 4.2 \rightarrow N = 5 \times 4 = 20)$

3.6.2 RECORDS

F. B. HAD USED FOR "SEA-LAND" AND "NEDLLOYD".
NO EXPERIENCE OF USAGE OF Q.A.C FOR CONTAINER SHIP

3.6.3 CONCLUSION

FASTENING BOLT SHALL BE USED.

3.7 STRENGTH OF FASTENING BOLT

3.7.1 TENSILE STRESS

$\sigma = \frac{W}{A}$, $A = \frac{\pi d_1^2}{4}$ d_1 : MINOR DIAMETER OF SCREW THREADS (37.129 mm)

$\therefore \sigma = \frac{4W}{\pi d_1^2} = \frac{4 \times 9320}{\pi \times 3.7129^2} = 861 \ kg/cm^2$

$S.F. = \frac{4500}{861} = 5.2$

NOTE ; BREAKING STRESS OF BOLT = 4500 kg/cm²

3.7.2 BEARING STRESS OF SCREW (P_s)

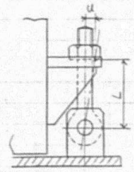
ALLOWABLE BEARING STRESS (P_a) = 4 kg/mm²

$P_s = \frac{W}{\frac{\pi}{4}(D^2 - d_1^2)n}$ D : MAJOR DIAMETER OF SCREW THREADS (42 mm)

$= \frac{9320}{\frac{\pi}{4} \times (42^2 - 37.129^2) \times 7.6}$ n : QUANTITY OF EFFECTIVE SCREW THREADS (7.6)

$= 4 \ kg/mm^2 = P_a$

3.7.3 STRESS OF BOLT AT TRANSFORMED HATCH COAMING



$\sigma = \frac{E\ell}{L}$ $\ell = \sqrt{L^2 - u^2} - L$

$L = 175$ mm, $E = 2.1 \times 10^6 \ kg/cm^2$

$u = 6.7$ max (RELATIVE DISPLACEMENT OF COAMING TOP AND COVER)

$\therefore \sigma = \frac{E(\sqrt{L^2 + u^2} - L)}{L}$

$= \frac{2.1 \times 10^6 \times (\sqrt{17.5^2 + 0.67^2} - 17.5)}{17.5}$

$= 1539 \ kg/cm^2 < \sigma_y = 2900 \ kg/cm^2$

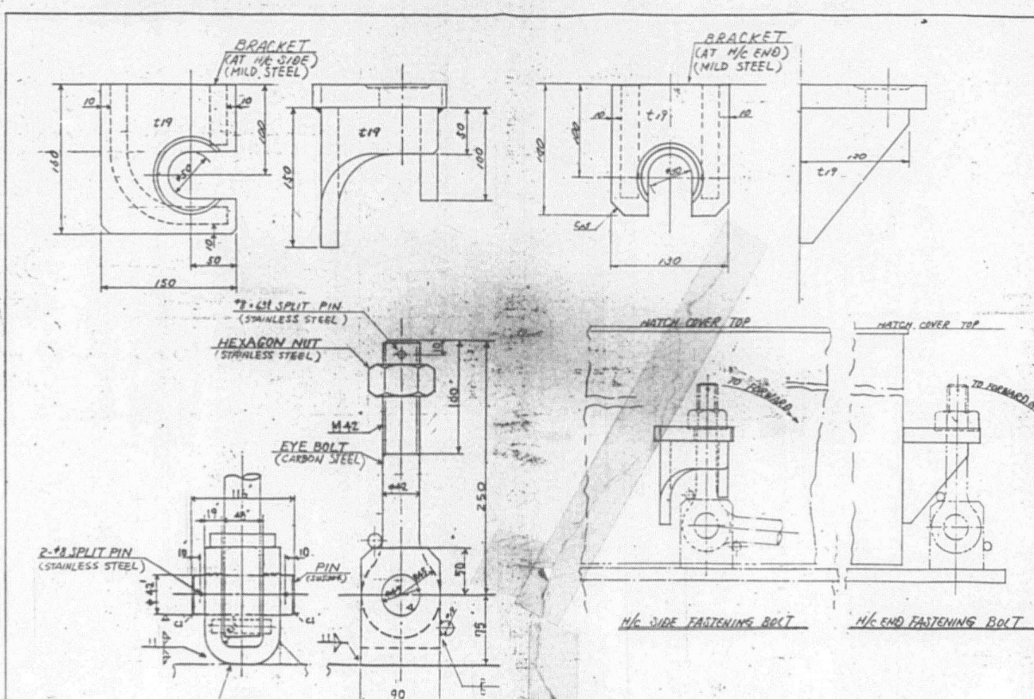
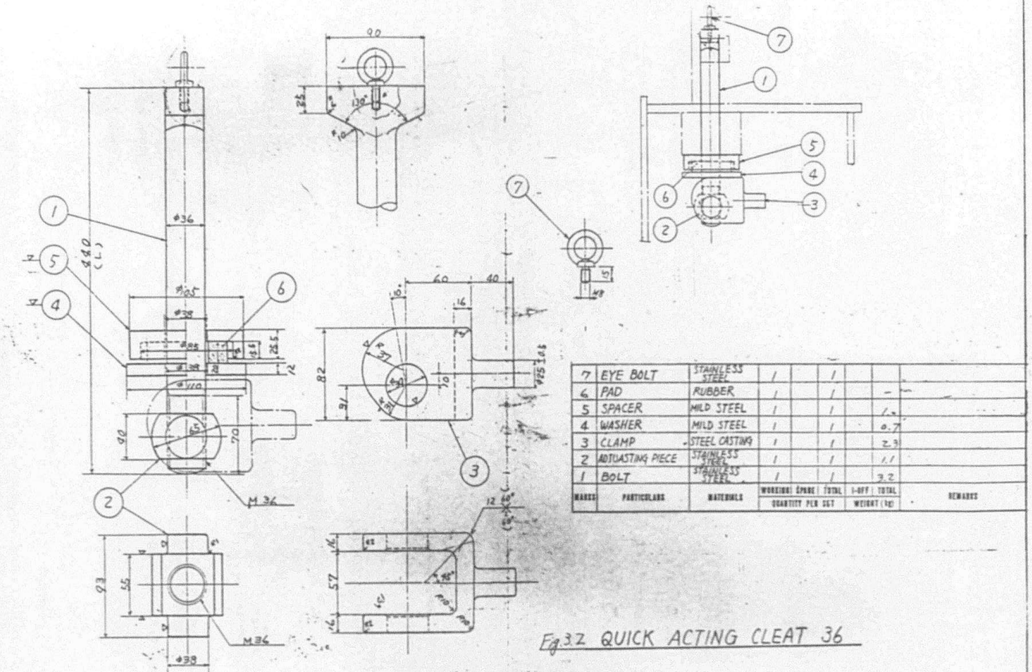


Fig.3.1 FASTENING BOLT AND BRACKET



MARKS	PARTICULARS	MATERIALS	WORKING	SPARE	TOTAL	1-OFF	TOTAL	REMARKS
			QUANTITY PER SET			WEIGHT (kg)		
7	EYE BOLT	STAINLESS STEEL	1		1			
6	PAD	RUBBER	1		1		-	
5	SPACER	MILD STEEL	1		1		1.[illegible]	
4	WASHER	MILD STEEL	1		1		0.7	
3	CLAMP	STEEL CASTING	1		1		2.3	
2	ADJUASTING PIECE	STAINLESS STEEL	1		1		1.1	
1	BOLT	STAINLESS STEEL	1		1		3.2	

Fig 3.2 QUICK ACTING CLEAT 36

4. STRENGTH (CALCULATION) OF BEARING PAD & HATCH COVER REST

4.1 BEARING PAD FOR HATCH COVER REST

(1) DESIGNING CONDITION

- DESIGNED BEARING PRESSURE = LESS THAN 120 kg/cm²
- METAL TOUCH RATE = MORE THAN 60%
- PERMISSIBLE BEARING PRESSURE = 200 kg/cm²

(2) BEARING PRESSURE OF PAD

BEARING PRESSURE OF PAD TO BE CALUCULATED BY FOLLOWING FORMULA.

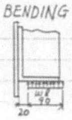
$$P = \frac{W}{L \cdot B}$$

WHERE P: BEARING PRESSURE OF PAD (kg/cm²)
W: STATIC LOAD ON EACH PAD (kg)
L: LENGTH OF PAD (cm)
B: BREADTH OF PAD (cm)

RESULTS OF CALCULATION TO BE SHOWN ON FIGS. 4-1 ~ 4-3.

4.2 HATCH COVER REST

(1) BENDING STRESS OF HATCH COVER REST

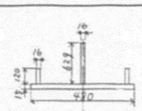


BENDING STRESS OF HATCH COVER REST TO BE CALCULATED BY FOLLOWING FORMULA.

$$\sigma = \frac{M}{Z} \qquad M = \frac{w\ell(9+2\times2)}{2} = 6.5w\ell$$

WHERE σ: BENDING STRESS (kg/cm²)
M: MOMENT (kg·cm)
Z: SECTION MODULUS OF HATCH COVER REST (cm³)
wℓ: UNIFORM LOAD ON HATCH COVER REST (kg)

技術資料 D



$Z = 1736\ cm^3$

$w\ell = max.\ 48800\ kg$

$M = 6.5 \times 48800 = 317200\ kg\cdot cm$

$\sigma = \frac{317200}{1736} = \underline{183\ kg/cm^2}$

$S.F. = \frac{4100}{183} = \underline{22}$

(2) SHEARING STRESS OF HATCH COVER REST

SHEARING STRESS OF HATCH COVER REST TO BE CALCULATED BY FOLLOWING FORMULA.

$$\tau = \frac{W}{A}$$

WHERE τ: SHEARING STRESS (kg/cm²)
W: STATIC LOAD ON HATCH COVER REST (kg)
A: SECTIONAL AREA OF HATCH COVER REST (cm²)

$W = 48800\ kg$

$A = 12 \times 1.6 \times 2 + 62.9 \times 1.6 = 139.04\ cm^2$

$\tau = \frac{48800}{139.04} = \underline{351\ kg/cm^2}$

技術資料 D

812

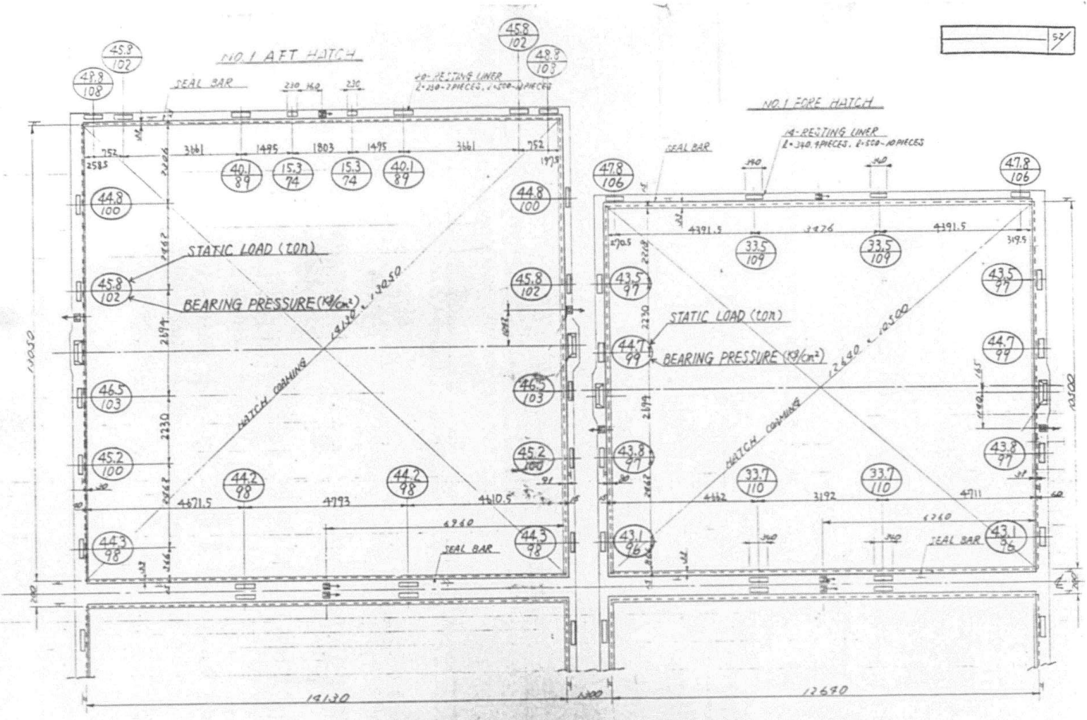


FIG. 4-1 STATIC LOAD AND BEARING PRESSURE ON EACH PAD (NO.1 HATCH)

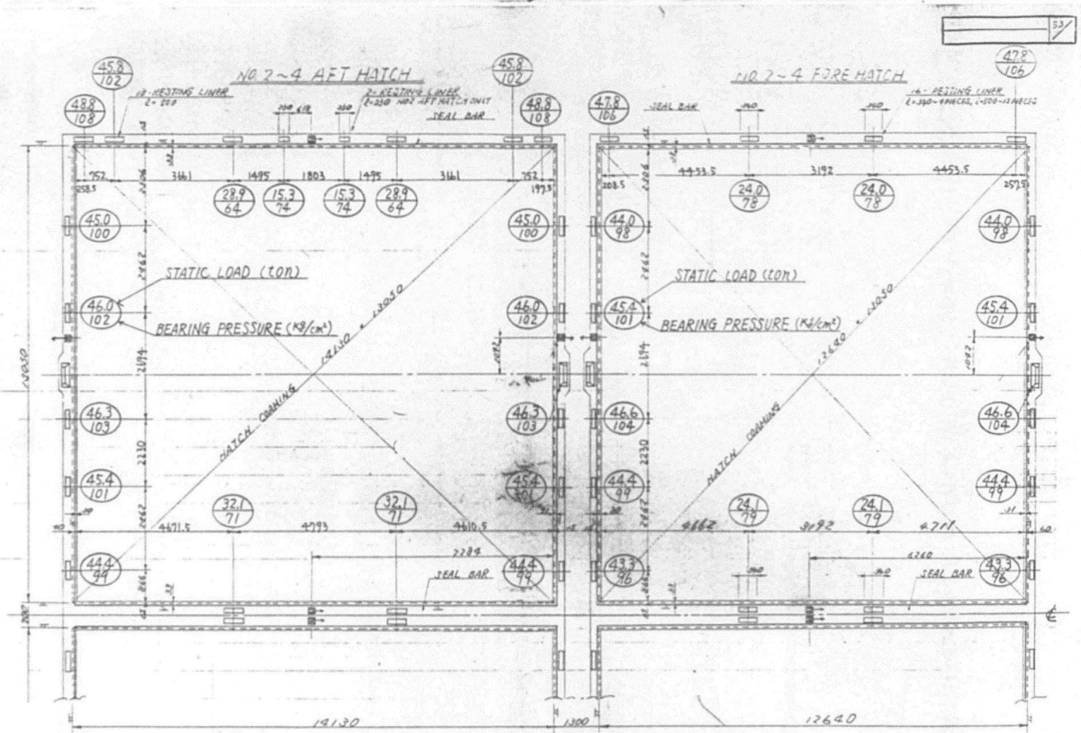


FIG. 4-2 STATIC LOAD AND BEARING PRESSURE ON EACH PAD (NO.2~4 HATCH)

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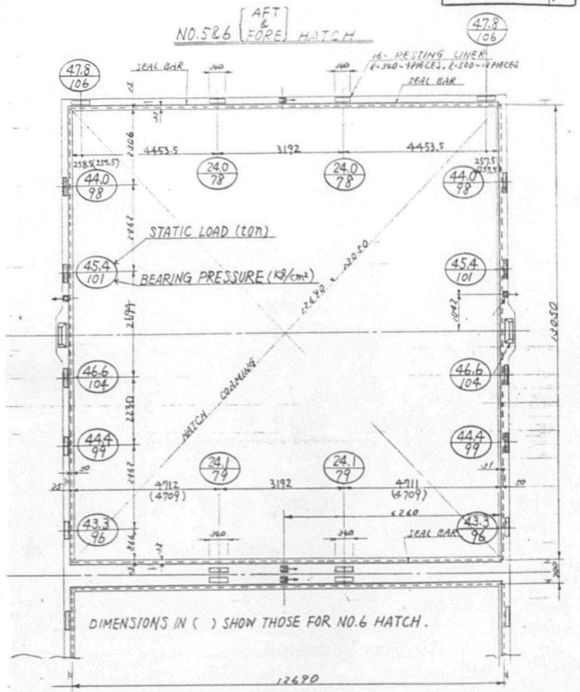


FIG. 4-3 STATIC LOAD AND BEARING PRESSURE ON EACH PAD (NO.5 & 6 HATCH)

55/

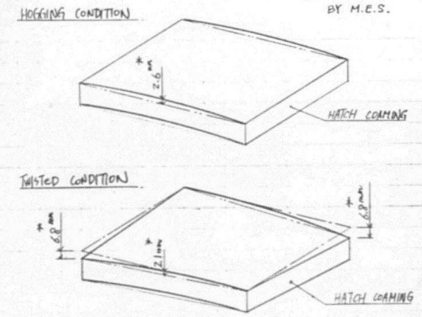
4.3 STRENGTH of HATCH COVER REST AND BEARING PAD ON DISTORTED HATCH COAMING.

TRANSFORMATION of HATCH COAMING AT SHIP'S HOGGING CONDITION AND TWISTED CONDITION TO BE AS BELOW.

*: CALCULATED BY M.E.S.

HOGGING CONDITION

TWISTED CONDITION



M.H.I's OPINION FOR STRENGTH of HATCH COVER REST AND BEARING PAD IN HOGGING CONDITION AND TWISTED CONDITION TO BE AS FOLLOWS.

i) 3 TON CONCENTRATED LOAD AT CENTER of SIDE PLATE TO BE ENOUGH TO CAUSE 2.6 mm DISPLACEMENT FOR NO.1 (F) HATCH COVER. (SMALLEST HATCH COVER TO BE MORE RIGID FOR BENDING)

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ii) CONCENTRATED LOAD BY CONTAINERS ON HATCH COVER TO BE 24.39 TON PER EACH CONTAINER DECK SOCKET. IT TO BE 48.77 TON FOR DOUBLE SOCKET.

iii) DISPLACEMENT of HATCH COVER AT CORNER END TO BE MORE EASILY CAUSED THAN DISPLACEMENT AT CENTER.

(iv) REFFERING TO ABOVE, EFFECT of TRANSFORMATION of HATCH COAMING ON STRENGTH of HATCH COVER REST AND BEARING PAD TO BE NEGRIGIBLE. SO THAT STRENGTH of THEM SHALL BE APPRECIATED IN 4.1 ~ 4.2.

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5. STRENGTH CALCULATION of HATCH COVER IN LIFTING BY 4 WIRE SLINGS

THE CALCULATION TO BE CONDUCTED ABOUT No.s 1 (A) AND 2 (F) HATCH COVER AS TYPICAL ONES.

CALCULATION TO BE EXECUTED BY M.H.I. "SANAS-F" (STRUCTURE ANALYSIS PROGRAM BY FINITE ELEMENT METHOD) AND "IBM-3084" ELECTRIC COMPUTER.

CALCULATION MODEL AND SUPPORT CONDITION of EACH HATCH COVER TO BE SHOWN ON Fig.s 5-1 AND 5-2 RESPECTIVELY. MEMBER PROPERTIES IN Fig.s 5-1 AND 5-2 TO BE CALCULATED AS TABLES 5-1 AND 5-2. OUTLINE CONSTRUCTION of EACH COVER TO BE SHOWN ON Fig.s 5-3 AND 5-4.

RESULTS OF CALCULATION TO BE SHOWN TABLES 3-8.

Z-DISPLACEMENT SHOWN ON TABLES 5-3 AND 5-4 INCLUDES DISPLACEMENT DUE TO EXTENSION of WIRE SLINGS AND ROTATION of HATCH COVER. NET DEFLECTION of HATCH COVER TO BE CALCULATED AS SHOWN ON THE RIGHT COLUMN of THE TABLES.

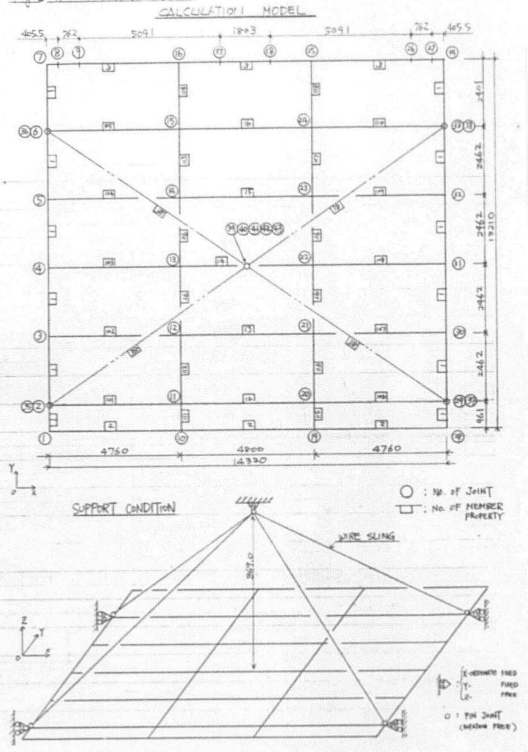
SUPPORT REACTIONS AND PIN JOINT REACTIONS (SHOWN AS INTERNAL BINDING FORCE) TO BE SHOWN ON TABLES 5-5 AND 5-6.

MAXIMUM STRESS IN MEMBERS TO BE SHOWN ON TABLES 5-7 AND 5-8

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Fig. 5-1 NO.1(A) HATCH COVER

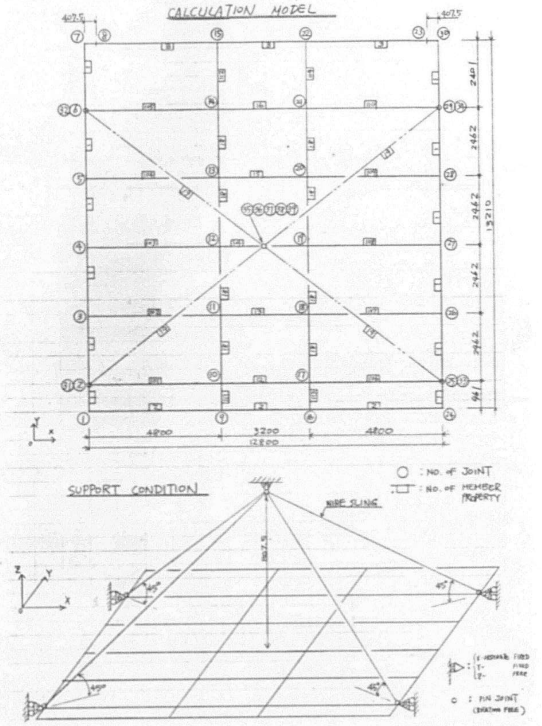
CALCULATION MODEL



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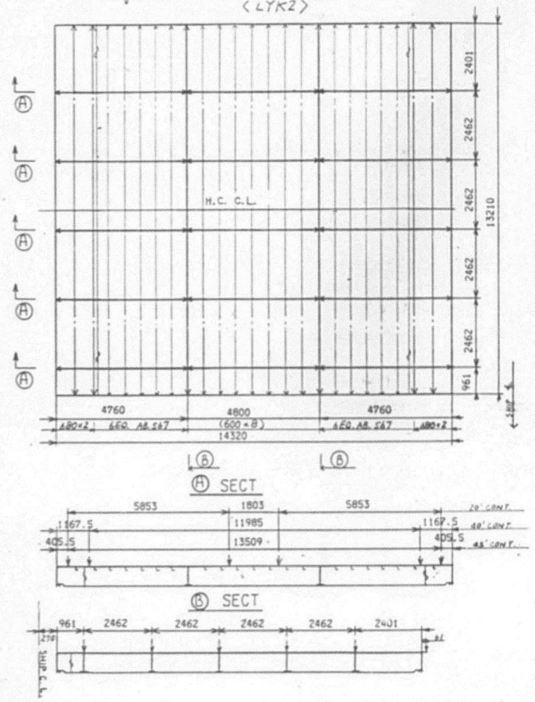
Fig. 5-2 NO.2(F)~6(F) & NO.5(A)~6(A) HATCH COVER

CALCULATION MODEL



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Fig. 5-3 NO.1A HATCH COVER
<LYK2>



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Fig. 5-4 NO.2(F) ~ 6(F)&NO.5(A).NO.6(A) HATCH COVER
<LYK3>

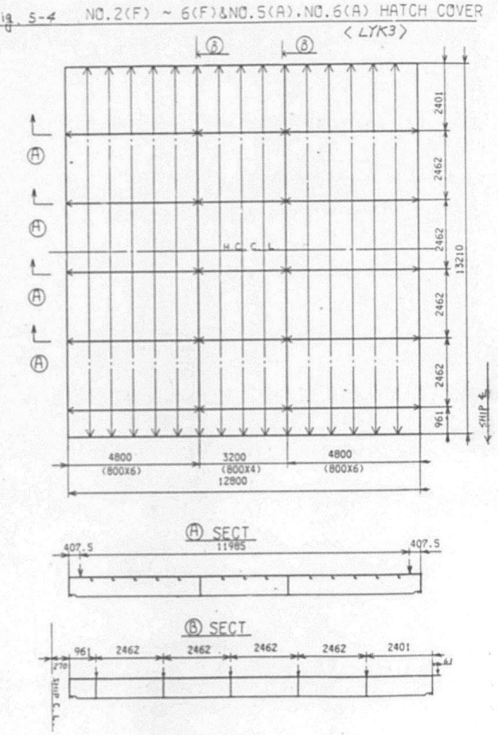
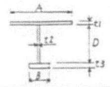


TABLE 5-1 (1/3)

MEMBER PROPERTIES

(NO. 1 HATCH COVER (AFT) <LYK2>)



* MARKED MATERIALS SHOWN HIGHER TENSILE STEEL (AH36).

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No	Top Pl. A x t1 (mm)	Web Pl. D x t2 (mm)	Face Pl. B x t3 (mm)	Sect. Area (cm2)	Web Area (cm2)	Moment of Inertia (cm4)	Sect. Modu. Upp. (cm3)	Sect. Modu. Low (cm3)	Remarks
1	2180x 6.0	700x 9.0	L100×75×10	209.3	63.0	118290	7553	2153	
2	480x 6.0	700x 9.0	L100×75×10	107.3	63.0	71336	2357	1769	Do.
3	1201x 6.0	700x 9.0	L100×75×10	150.6	63.0	99019	4573	2023	Do.
4	1711x 7.0	* 600x 8.0	* 140x20.0	195.8	48.0	112536	6793	2439	
5	1711x 7.0	* 680x 7.0	* 140x20.0	195.4	47.6	143698	7702	2761	
6	2462x 7.0	* 600x 8.0	* 160x20.0	252.3	48.0	132722	9546	2720	
7	2462x 7.0	* 680x 7.0	* 160x20.0	251.9	47.6	169461	10829	3078	
8	2462x 7.0	* 600x 8.0	* 230x20.0	266.3	48.0	163029	9931	3522	
9	2462x 7.0	* 680x 8.0	* 230x20.0	272.7	54.4	212576	11249	4104	
10	2462x 7.0	* 600x 8.0	* 160x20.0	252.3	48.0	132722	9546	2720	
11	2462x 7.0	* 680x 7.0	* 160x20.0	251.9	47.6	169461	10829	3078	
12	1711x 6.0	* 680x 7.0	* 80x20.0	166.3	47.6	105986	6313	1970	
13	2462x 6.0	* 680x 7.0	* 140x20.0	223.3	47.6	151657	9304	2793	
14	2462x 6.0	* 680x 7.0	* 320x20.0	259.3	47.6	239743	10116	5112	
15	2462x 6.0	* 680x 7.0	* 230x20.0	241.3	47.6	198985	9814	3954	
16	2462x 6.0	* 680x 7.0	* 80x20.0	211.3	47.6	115626	8711	2017	
17	2432x 7.0	* 600x 8.0	* 140x20.0	246.2	48.0	123089	9295	2489	

(2/3)

MEMBER PROPERTIES

(NO. 1 HATCH COVER (AFT) <LYK2>)

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No	Top Pl. A x t1 (mm)	Web Pl. D x t2 (mm)	Face Pl. B x t3 (mm)	Sect. Area (cm2)	Web Area (cm2)	Moment of Inertia (cm4)	Sect. Modu. Upp. (cm3)	Sect. Modu. Low (cm3)	Remarks
18	2432x 7.0	* 680x 7.0	* 140x20.0	245.8	47.6	157144	10547	2816	
19	4359x 6.0	* 600x 7.0	* 370x20.0	377.5	42.0	239887	15293	5113	
20	4359x 6.0	* 680x 7.0	* 370x20.0	383.1	47.6	310456	17300	5896	
21	4359x 6.0	* 680x 7.0	* 446x20.0	398.3	47.6	349468	17546	6895	
22	4359x 6.0	* 680x 7.0	* 510x20.0	411.1	47.6	380085	17708	7735	
23	4359x 6.0	* 680x 7.0	* 572x20.0	423.5	47.6	407980	17837	8548	
24	4359x 6.0	* 680x 7.0	* 626x20.0	434.3	47.6	430977	17931	9255	
25	4359x 6.0	* 680x 7.0	* 678x20.0	444.7	47.6	452069	18010	9936	
26	4359x 6.0	* 680x 7.0	* 730x20.0	455.1	47.6	472195	18080	10615	
27	1711x 6.0	* 680x 7.0	* 140x20.0	178.3	47.6	137205	6744	2730	
28	2462x 6.0	* 680x 7.0	* 160x20.0	227.3	47.6	162822	9446	3051	
29	2462x 6.0	* 680x 8.0	* 230x20.0	248.1	54.4	202962	9820	4065	
30	2462x 6.0	* 680x 7.0	* 160x20.0	227.3	47.6	162822	9446	3051	
31	2432x 6.0	* 680x 7.0	* 140x20.0	221.5	47.6	151192	9202	2791	
32	1711x 7.0	* 680x 8.0	* 140x20.0	202.2	54.4	148009	7710	2874	
33	2462x 7.0	* 680x 8.0	* 160x20.0	258.7	54.4	174484	10805	3199	
34	2462x 7.0	* 680x 8.0	* 230x20.0	272.7	54.4	212576	11249	4104	

(3/3)

MEMBER PROPERTIES

(NO. 1 HATCH COVER (AFT) <LYK2>)

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No	Top Pl. A x t1 (mm)	Web Pl. D x t2 (mm)	Face Pl. B x t3 (mm)	Sect. Area (cm2)	Web Area (cm2)	Moment of Inertia (cm4)	Sect. Modu. Upp. (cm3)	Sect. Modu. Low (cm3)	Remarks
35	2462x 7.0	* 680x 8.0	* 160x20.0	258.7	54.4	174484	10805	3199	
36	2432x 7.0	* 680x 8.0	* 140x20.0	252.6	54.4	162358	10521	2938	
37	4359x 6.0	* 600x 8.0	* 370x20.0	383.5	48.0	243000	15265	5206	
38	WIRE SLING			7.0T	–	–	–	–	

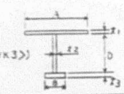
NOTE; ~

MEMBERS NUMBERED 101 AND OVER SHOWN ON Fig.5 1 AND 2 TO BE COMPOUNDED MEMBER. DETAIL TO BE SHOWN ON ANOTHER DRAWING, "STRENGTH CALCULATION OF STEEL HATCH COVER" (DWG. NO. FA-56003).

TABLE 5-2.

MEMBER PROPERTIES

(NO. 2-6 (FORE) & 5, 6 (AFT) H. COVER <LYK3>)



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Page 1/ 2

No	Top Pl. A x t1 (mm)	Web Pl. D x t2 (mm)	Face Pl. B x t3 (mm)	Sect. Area (cm2)	Web Area (cm2)	Moment of Inertia (cm4)	Sect. Modu. Upp. (cm3)	Sect. Modu. Low (cm3)	Remarks
1	2180x 8.0	700x 9.0	L100×75×10	252.9	63.0	127254	9681	2207	L100×75×10
2	480x 8.0	700x 9.0	L100×75×10	116.9	63.0	79461	2841	1855	Do.
3	1201x 8.0	700x 9.0	L100×75×10	174.6	63.0	108823	5770	2095	Do.
4	1711x 8.0	600x10.0	90x20.0	214.9	60.0	101392	7226	2079	
5	1711x 8.0	680x10.0	90x20.0	222.9	68.0	135605	8218	2497	
6	2432x 8.0	600x10.0	90x20.0	272.6	60.0	109845	9854	2127	
7	2432x 8.0	680x10.0	90x20.0	280.6	68.0	147485	11182	2560	
8	2462x 8.0	600x10.0	250x20.0	307.0	60.0	183947	11255	3960	
9	2462x 8.0	680x10.0	250x20.0	315.0	68.0	240369	12756	4626	
10	2462x 8.0	600x10.0	140x20.0	285.0	60.0	134972	10517	2701	
11	2462x 8.0	680x10.0	140x20.0	293.0	68.0	178950	11916	3208	
12	1711x 8.0	680x 8.0	90x20.0	209.3	54.4	125514	8198	2262	
13	2462x 8.0	680x 8.0	90x20.0	269.4	54.4	135896	11339	2311	
14	2462x 8.0	680x 8.0	300x20.0	311.4	54.4	257359	13009	5045	
15	2462x 8.0	680x 8.0	180x20.0	287.4	54.4	192298	12322	3484	
16	2432x 8.0	680x 8.0	90x20.0	267.0	54.4	135570	11214	2309	
17	3780x 8.0	600x 8.0	430x20.0	436.4	48.0	278936	17606	5940	
18	3780x 8.0	680x 8.0	430x20.0	442.8	54.4	360784	19927	6847	
19	WIRE SLING			7.0T	–	–	–	–	

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TABLE 5-4

.2 - 4 (F) & 5,6 (A) STEEL HATCH COVER LIFTING (DEADWEIGHT)

LIFT = LYK3 , GRID (PAGE 1)

***** EXTERNAL JOINT DISPLACEMENTS *****

S.JOI. GROUP	SUPPORT	JOINT	X-DISP. (cm)	Y-DISP. (cm)	Z-DISP. (cm)	X-ROTATION (RAD.)	Y-ROTATION (RAD.)	Z-ROTATION (RAD.)	NET DEFLECTION (cm)
		1	0.0	0.0	-0.94092745	-0.00114853	0.00134460	0.0	0.0913904
	(110000)	2	0.0	0.0	-1.05206951	-0.00117281	0.00116819	0.0	0.0
		3	0.0	0.0	-1.32709971	-0.00094668	0.00074235	0.0	-0.1988090
		4	0.0	0.0	-1.48086434	-0.00026540	0.00057273	0.0	-0.2763524
		5	0.0	0.0	-1.46271224	0.00035582	0.00078651	0.0	-0.1819790
	(110000)	6	0.0	0.0	-1.35695443	0.00035195	0.00115499	0.0	0.0
		7	0.0	0.0	-1.30787919	0.00013277	0.00135529	0.0	0.1234920
		8	0.0	0.0	-1.38301595	0.0	0.00134858	0.0	0.0682712
		9	0.0	0.0	-1.45067964	-0.00047193	0.00052208	0.0	-0.4283618
		10	0.0	0.0	-1.49588901	-0.00046785	0.00046933	0.0	-0.4438195
		11	0.0	0.0	-1.60518026	-0.00040802	0.00028867	0.0	-0.4768895
		12	0.0	0.0	-1.69317238	-0.00030398	0.00020585	0.0	-0.4886604
		13	0.0	0.0	-1.75492024	-0.00020066	0.00028403	0.0	-0.4741870
		14	0.0	0.0	-1.79451098	-0.00012822	0.00046119	0.0	-0.4375566
		15	0.0	0.0	-1.82114995	-0.00010080	0.00052495	0.0	-0.3898623
		16	0.0	0.0	-1.45067964	-0.00047193	-0.00052208	0.0	-0.4283618
		17	0.0	0.0	-1.49588901	-0.00046785	-0.00046933	0.0	-0.4438195
		18	0.0	0.0	-1.60518026	-0.00040802	-0.00028867	0.0	-0.4768895
		19	0.0	0.0	-1.69317238	-0.00030398	-0.00020585	0.0	-0.4886604
		20	0.0	0.0	-1.75492024	-0.00020066	-0.00028403	0.0	-0.4741870
		21	0.0	0.0	-1.79451098	-0.00012822	-0.00046119	0.0	-0.4375566
		22	0.0	0.0	-1.82114995	-0.00010080	-0.00052495	0.0	-0.3898623
		23	0.0	0.0	-1.38301595	0.0	-0.00134858	0.0	0.0682712
		24	0.0	0.0	-0.94092745	-0.00114853	-0.00134460	0.0	0.0813904
	(110000)	25	0.0	0.0	-1.05206951	-0.00117281	-0.00116819	0.0	0.0
		26	0.0	0.0	-1.32709971	-0.00094668	-0.00074235	0.0	-0.1988090
		27	0.0	0.0	-1.48086434	-0.00026540	-0.00057273	0.0	-0.2763524
		28	0.0	0.0	-1.46271224	0.00035582	-0.00078651	0.0	-0.1819790
	(110000)	29	0.0	0.0	-1.35695443	0.00035195	-0.00115499	0.0	0.0
		30	0.0	0.0	-1.30787919	0.00013277	-0.00135529	0.0	0.1234080
		31	0.0	0.0	-1.05206951	0.0	0.0	0.0	0.0
		32	0.0	0.0	-1.35695443	0.0	0.0	0.0	0.0
		33	0.0	0.0	-1.05206951	0.0	0.0	0.0	0.0
		34	0.0	0.0	-1.35695443	0.0	0.0	0.0	0.0
		35	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		36	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		37	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		38	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	(111000)	39	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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TABLE 5-3

NO. 1 (A) STEEL HATCH COVER LIFTING (DEADWEIGHT)

LIFT = LYK2 , GRID (PAGE 1)

***** EXTERNAL JOINT DISPLACEMENTS *****

S.JOI. GROUP	SUPPORT	JOINT	X-DISP. (cm)	Y-DISP. (cm)	Z-DISP. (cm)	X-ROTATION (rad.)	Y-ROTATION (rad.)	Z-ROTATION (rad.)	NET DEFLECTION (cm)
		1	0.0	0.0	-0.93666631	-0.00119453	0.00161099	0.0	0.0866422
	(110000)	2	0.0	0.0	-1.05220632	-0.00121806	0.00138010	0.0	0.0
		3	0.0	0.0	-1.33658564	-0.00097166	0.00093813	0.0	-0.2103456
		4	0.0	0.0	-1.49203515	-0.00025470	0.00075909	0.0	-0.2917614
		5	0.0	0.0	-1.46725903	0.00039818	0.00099012	0.0	-0.1929516
	(110000)	6	0.0	0.0	-1.34834120	0.00041290	0.00138028	0.0	0.0
		7	0.0	0.0	-1.28405867	0.00019707	0.00165618	0.0	0.1364819
		8	0.0	0.0	-1.35112559	0.0	0.00164943	0.0	0.0694150
		9	0.0	0.0	-1.47526322	0.0	0.00160118	0.0	-0.0547226
		10	0.0	0.0	-1.57023823	-0.00040456	0.00079639	0.0	-0.5469297
		11	0.0	0.0	-1.60898376	-0.00040078	0.00076869	0.0	-0.5567774
		12	0.0	0.0	-1.70326578	-0.00035884	0.00045890	0.0	-0.5770257
		13	0.0	0.0	-1.78376784	-0.00029284	0.00034066	0.0	-0.5834941
		14	0.0	0.0	-1.84738239	-0.00022589	0.00043824	0.0	-0.5730749
		15	0.0	0.0	-1.89652208	-0.00017706	0.00075798	0.0	-0.5481809
		16	0.0	0.0	-1.93550727	-0.00015283	0.00081894	0.0	-0.5149667
		17	0.0	0.0	-2.02049470	0.0	0.00031184	0.0	-0.5994541 ← MAX.
		18	0.0	0.0	-2.02049470	0.0	-0.00031184	0.0	-0.5994541 ← MAX.
		19	0.0	0.0	-1.57023823	-0.00040456	-0.00079639	0.0	-0.5469297
		20	0.0	0.0	-1.60898376	-0.00040078	-0.00076869	0.0	-0.5567774
		21	0.0	0.0	-1.70326578	-0.00035884	-0.00045890	0.0	-0.5770257
		22	0.0	0.0	-1.78376784	-0.00029284	-0.00034066	0.0	-0.5834941
		23	0.0	0.0	-1.84738239	-0.00022589	-0.00043824	0.0	-0.5730749
		24	0.0	0.0	-1.89652208	-0.00017706	-0.00075798	0.0	-0.5481809
		25	0.0	0.0	-1.93550727	-0.00015283	-0.00081894	0.0	-0.5149667
		26	0.0	0.0	-1.47526322	0.0	-0.00160118	0.0	-0.0547226
		27	0.0	0.0	-1.35112559	0.0	-0.00164943	0.0	0.0694150
		28	0.0	0.0	-0.93666631	-0.00119453	-0.00161099	0.0	0.0866422
	(110000)	29	0.0	0.0	-1.05220632	-0.00121806	-0.00138010	0.0	0.0
		30	0.0	0.0	-1.33658564	-0.00097166	-0.00093813	0.0	-0.2103456
		31	0.0	0.0	-1.49203515	-0.00025470	-0.00075909	0.0	-0.2917614
		32	0.0	0.0	-1.46725903	0.00039818	-0.00099012	0.0	-0.1929516
	(110000)	33	0.0	0.0	-1.34834120	0.00041290	-0.00138028	0.0	0.0
		34	0.0	0.0	-1.28405867	0.00019707	-0.00165618	0.0	0.1364819
		35	0.0	0.0	-1.05220632	0.0	0.0	0.0	0.0
		36	0.0	0.0	-1.34834120	0.0	0.0	0.0	0.0
		37	0.0	0.0	-1.05220632	0.0	0.0	0.0	0.0
		38	0.0	0.0	-1.34834120	0.0	0.0	0.0	0.0
		39	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		40	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		41	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		42	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	(111000)	43	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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TABLE 5-6

NO.2 - 4 (F) & 5,6 (A) STEEL HATCH COVER LIFTING (DEADWEIGHT)

LIFT = LYK3 , GRID (PAGE 6)

***** SUPPORT REACTIONS *****

S.JOI.	SUPPORT	JOINT	X-DIR.FORCE (Ton)	Y-DIR.FORCE (Ton)	Z-DIR.FORCE (Ton)	X-AXIS.MOM.	Y-AXIS.MOM.	Z-AXIS.MOM.
	(110000)	2	-5.42041213	-4.17032958	0.0	0.0	0.0	0.0
	(110000)	6	-6.99122268	5.37887195	0.0	0.0	0.0	0.0
	(110000)	25	5.42041213	-4.17032958	0.0	0.0	0.0	0.0
	(110000)	29	6.99122268	5.37887195	0.0	0.0	0.0	0.0
	(111000)	39	0.00000000	-2.41708474	31.44674215	0.0	0.0	0.0

.2 - 4 (F) & 5,6 (A) STEEL HATCH COVER LIFTING (DEADWEIGHT)

LIFT = LYK3 , GRID (PAGE 8)

***** INTERNAL BINDING FORCES (THE HIGHEST MASTER JOINT) *****

S.JOI	MJ	X-DIR.FORCE (Ton)	Y-DIR.FORCE (Ton)	Z-DIR.FORCE (Ton)	X-AXIS.MOM.	Y-AXIS.MOM.	Z-AXIS.MOM.
	2	5.42041213	4.17032958	6.80734601	0.0	0.0	0.0
	6	6.99122268	-5.37887195	8.78938714	0.0	0.0	0.0
	25	-5.42041213	4.17032958	6.80734601	0.0	0.0	0.0
	29	-6.99122268	-5.37887195	8.78938714	0.0	0.0	0.0
	39	-0.00000000	2.41708474	-31.44874215	0.0	0.0	0.0

.2 - 4 (F) & 5,6 (A) STEEL HATCH COVER LIFTING (DEADWEIGHT)

LIFT = LYK3 , GRID (PAGE 7)

***** INTERNAL BINDING FORCES (SLAVE JOINT) *****

S.JOI	SUPPORT	SJ	MJ	X-DIR.FORCE (Ton)	Y-DIR.FORCE (Ton)	Z-DIR.FORCE (Ton)	X-AXIS.MOM.	Y-AXIS.MOM.	Z-AXIS.MOM.
	(111000)	31	2	5.42041213	4.17032958	6.80734601	0.0	0.0	0.0
	(111000)	32	6	6.99122268	-5.37887195	8.78938714	0.0	0.0	0.0
	(111000)	33	25	-5.42041213	4.17032958	6.80734601	0.0	0.0	0.0
	(111000)	34	29	-6.99122268	-5.37887195	8.78938714	0.0	0.0	0.0
	(111000)	35	39	-5.42041213	-4.17032958	-6.87072522	0.0	0.0	0.0
	(111000)	36	39	-6.99122268	5.37887195	-6.86264635	0.0	0.0	0.0
	(111000)	37	39	5.42041213	-4.17032958	-6.87072522	0.0	0.0	0.0
	(111000)	38	39	6.99122268	5.37887195	-6.86264635	0.0	0.0	0.0

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TABLE 5-5

NO. 1 (A) STEEL HATCH COVER LIFTING (DEADWEIGHT)

LIFT = LYK2 , GRID (PAGE 7)

***** SUPPORT REACTIONS *****

S.JOI.	SUPPORT	JOINT	X-DIR.FORCE (Ton)	Y-DIR.FORCE (Ton)	Z-DIR.FORCE (Ton)	X-AXIS.MOM.	Y-AXIS.MOM.	Z-AXIS.MOM.
	(110000)	2	-5.23707104	-3.60158349	0.0	0.0	0.0	0.0
	(110000)	6	-6.71100195	4.61521978	0.0	0.0	0.0	0.0
	(110000)	29	5.23707104	-3.60158349	0.0	0.0	0.0	0.0
	(110000)	33	6.71100195	4.61521978	0.0	0.0	0.0	0.0
	(111000)	43	0.00000000	-2.02727257	29.13885560	0.0	0.0	0.0

NO. 1 (A) STEEL HATCH COVER LIFTING (DEADWEIGHT)

LIFT = LYK2 , GRID (PAGE 9)

***** INTERNAL BINDING FORCES (THE HIGHEST MASTER JOINT) *****

S.JOI	MJ	X-DIR.FORCE (Ton)	Y-DIR.FORCE (Ton)	Z-DIR.FORCE (Ton)	X-AXIS.MOM.	Y-AXIS.MOM.	Z-AXIS.MOM.
	2	5.23707104	3.60158349	6.32208326	0.0	0.0	0.0
	6	6.71100195	-4.61521978	6.11098427	0.0	0.0	0.0
	29	-5.23707104	3.60158349	6.32208326	0.0	0.0	0.0
	33	-6.71100195	-4.61521978	6.11098427	0.0	0.0	0.0
	43	-0.00000000	2.02727257	-29.13885560	0.0	0.0	0.0

NO. 1 (A) STEEL HATCH COVER LIFTING (DEADWEIGHT)

LIFT = LYK2 , GRID (PAGE 8)

***** INTERNAL BINDING FORCES (SLAVE JOINT) *****

S.JOI	SUPPORT	SJ	MJ	X-DIR.FORCE (Ton)	Y-DIR.FORCE (Ton)	Z-DIR.FORCE (Ton)	X-AXIS.MOM.	Y-AXIS.MOM.	Z-AXIS.MOM.
	(111000)	35	2	5.23707104	3.60158349	6.32208326	0.0	0.0	0.0
	(111000)	36	6	6.71100195	-4.61521978	6.11098427	0.0	0.0	0.0
	(111000)	37	29	-5.23707104	3.60158349	6.32208326	0.0	0.0	0.0
	(111000)	38	33	-6.71100195	-4.61521978	6.11098427	0.0	0.0	0.0
	(111000)	39	43	-5.23707104	-3.60158349	-6.39026840	0.0	0.0	0.0
	(111000)	40	43	-6.71100195	4.61521978	-6.17915940	0.0	0.0	0.0
	(111000)	41	43	5.23707104	-3.60158349	-6.39026839	0.0	0.0	0.0
	(111000)	42	43	6.71100195	4.61521978	-6.17915940	0.0	0.0	0.0

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TABLE 5-7 NO.1 (A) HATCH COVER

No. of MEMBER	MAX. SHEARING STRESS (kg/cm²)	MAX. BENDING STRESS (kg/cm²) UPPER	MAX. BENDING STRESS (kg/cm²) LOWER
1	63.5	109.0	382.4
2	19.2	214.2	285.4
3	27.4	157.6	356.3
12	6.6	114.9	368.3
13	8.8	67.4	224.5
14	10.2	72.6	143.8
15	9.6	79.6	197.6
16	8.4	90.1	389.3
26	13.9	15.7	26.7
101	37.5	102.0	252.0
102	34.5	62.0	206.5
103	39.7	68.9	166.4
104	41.2	76.9	238.2
105	41.5	80.1	264.2
106	37.5	102.0	252.0
107	34.5	62.0	206.5
108	39.7	68.9	166.4
109	41.2	76.9	238.2
110	41.5	80.1	264.2
111	12.7	2.6	7.5
112	23.4	12.2	21.5
113	18.0	12.6	21.5
114	20.9	6.9	14.7
115	12.7	2.6	7.5
116	23.4	12.2	21.5
117	18.0	12.6	21.5
118	20.9	6.9	14.7

TABLE 5-8 NO.2-6 (F) & 5.6 (A) HATCH COVER

No. of MEMBER	MAX. SHEARING STRESS (kg/cm²)	MAX. BENDING STRESS (kg/cm²) UPPER	MAX. BENDING STRESS (kg/cm²) LOWER
1	67.3	87.6	384.4
2	21.3	193.1	295.8
3	29.7	131.2	361.3
12	4.8	95.5	346.2
13	6.2	46.2	226.9
14	7.1	54.2	140.0
15	6.6	58.9	208.2
16	6.2	74.2	360.4
18	24.3	16.8	49.0
101	33.4	92.7	305.2
102	26.0	44.5	194.2
103	33.2	52.8	145.6
104	33.3	58.5	217.1
105	36.7	72.0	314.6
106	33.4	92.7	305.2
107	26.0	44.5	194.2
108	33.2	52.8	145.6
109	33.3	58.5	217.1
110	36.7	72.0	314.6
111	15.7	2.8	8.2
112	20.7	6.9	20.2
113	15.7	2.8	8.2
114	20.7	6.9	20.2

6. STRENGTH CALCULATION OF HATCH COVER IN LIFTING BY SPREADER

THE CALCULATION TO BE CONDUCTED ABOUT No.5 (A) AND 2(F) HATCH COVER AS TYPICAL ONES.

CALCULATION TO BE EXECUTED BY M.H.I. "SANAS-F" (STRUCTURE ANALYSYS PROGRAM BY FINITE ELEMENT METHOD) AND "IBM-3084" ELECTRIC COMPUTER.

CALCULATION MODEL OF EACH HATCH COVER TO BE SHOWN ON Fig.s 6-1 AND 6-2. RESPECTIVELY. MEMBER PROPERTIES IN Fig.s 6-1 AND 6-2. TO BE CALCULATED AS TABLES 6-1 AND 6-2. OUTLINE CONSTRUCTION OF EACH COVER TO BE SHOWN ON THE FIGURE IN THE PREVIOUS SECTION.

RESULTS OF CALCULATION TO BE SHOWN ON TABLES 6-1 ~ 6-8.

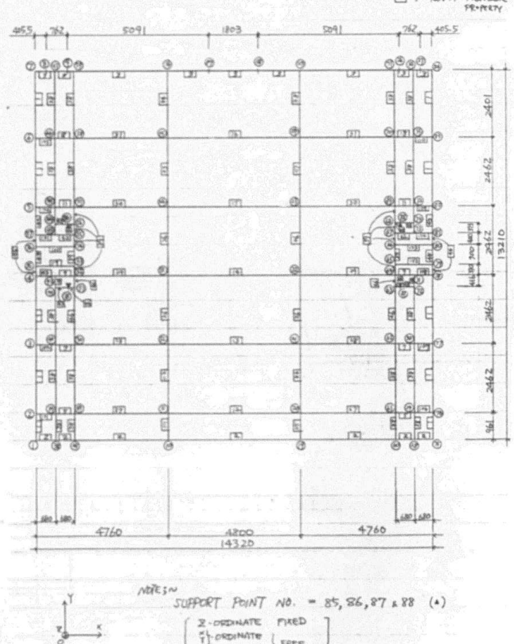
DEFLECTION OF HATCH COVER TO BE SHOWN ON TABLES 6-3 AND 6-4 AS Z-DISPLACEMENT.

SUPPORT REACTIONS TO BE SHOWN ON TABLES 6-5 AND 6-6.

MAXIMUM STRESS IN MEMBERS TO BE SHOWN ON TABLES 6-7 AND 6-8.

Fig. 6-1 NO 2 (A) HATCH COVER

CALCULATION MODEL

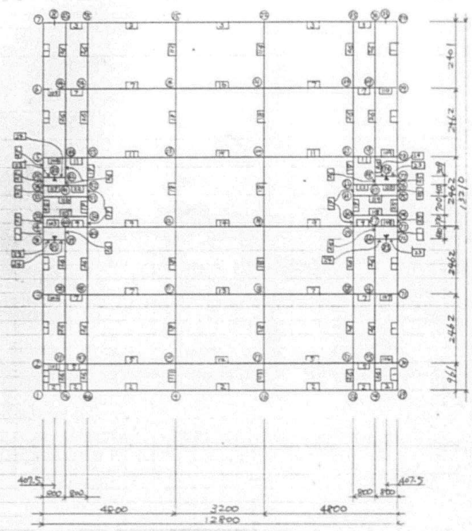


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Fig 6-2 NO. Z-6(F) & 5.6(A) HATCH COVER

CALCULATION MODEL

○ : No. of JOINT
□ : No. of MEMBER PROPERTY



NOTE;~
SUPPORT POINT NO. = 81, 82, 83 & 84 (▲)

[Z-ORDINATE FIXED ; X,Y-ORDINATE ROTATION FREE]

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TABLE 6-1 (1/3)

MEMBER PROPERTIES

NO. 1 HATCH COVER (AFT) <LYXD>

* MARKED MATERIALS SHOWN HIGHER TENSILE STEEL (AH36).

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No	Top Pl. A x t1 (mm)	Web Pl. D x t2 (mm)	Face Pl. B x t3 (mm)	Sect. Area (cm2)	Web Area (cm2)	Moment of Inertia (cm4)	Sect. Modu. Upp. (cm3)	Sect. Modu. Low (cm3)	Remarks
1	2180x 7.0 ~~2180x 8.0~~	700x 9.0	L100x75x10	232.1 ~~209.3~~	63.0	126720 ~~118280~~	8716 ~~7888~~	2256 ~~2183~~	
2	480x 6.0	700x 9.0	L100x75x10	107.3	63.0	71336	2357	1769	Do.
3	1201x 6.0	700x 9.0	L100x75x10	130.6	63.0	99019	4573	2023	Do.
4	1711x 7.0	* 600x 8.0	* 140x20.0	195.8	48.0	112536	6793	2439	
5	1711x 7.0	* 680x 7.0	* 140x20.0	195.4	47.6	143698	7702	2761	
6	2462x 7.0	* 600x 8.0	* 160x20.0	252.3	48.0	132722	9546	2720	
7	2462x 7.0	* 680x 7.0	* 160x20.0	251.9	47.6	169461	10829	3078	
8	2462x 7.0	* 600x 8.0	* 230x20.0	266.3	48.0	163029	9931	3522	
9	2462x 7.0	* 680x 8.0	* 230x20.0	272.7	54.4	212576	11249	4104	
10	2462x 7.0	* 600x 8.0	* 160x20.0	252.3	48.0	132722	9546	2720	
11	2462x 7.0	* 680x 7.0	* 160x20.0	251.9	47.6	169461	10829	3078	
12	1711x 6.0	* 680x 7.0	* 80x20.0	166.3	47.6	105986	6313	1970	
13	2462x 6.0	* 680x 7.0	* 140x20.0	223.3	47.6	151657	9304	2793	
14	2462x 6.0	* 680x 7.0	* 320x20.0	259.3	47.6	239743	10116	5112	
15	2462x 6.0	* 680x 7.0	* 230x20.0	241.3	47.6	198985	9814	3954	
16	2462x 6.0	* 680x 7.0	* 80x20.0	211.3	47.6	115626	8711	2017	
17	2432x 7.0	* 600x 8.0	* 140x20.0	246.2	48.0	123089	9295	2489	

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(2/3)

MEMBER PROPERTIES

NO. 1 HATCH COVER (AFT) <LYXD>

Page 2/ 3

No	Top Pl. A x t1 (mm)	Web Pl. D x t2 (mm)	Face Pl. B x t3 (mm)	Sect. Area (cm2)	Web Area (cm2)	Moment of Inertia (cm4)	Sect. Modu. Upp. (cm3)	Sect. Modu. Low (cm3)	Remarks
18	2432x 7.0	* 680x 7.0	* 140x20.0	245.8	47.6	157144	10547	2816	
19	4359x 6.0	* 600x 7.0	* 370x20.0	377.5	42.0	239887	15293	5113	
20	4359x 6.0	* 680x 7.0	* 370x20.0	383.1	47.6	310456	17300	5896	
21	4359x 6.0	* 680x 7.0	* 446x20.0	398.3	47.6	349468	17546	6895	
22	4359x 6.0	* 680x 7.0	* 510x20.0	411.1	47.6	380085	17708	7735	
23	4359x 6.0	* 680x 7.0	* 572x20.0	423.5	47.6	407980	17837	8548	
24	4359x 6.0	* 680x 7.0	* 626x20.0	434.3	47.6	430977	17931	9255	
25	4359x 6.0	* 680x 7.0	* 678x20.0	444.7	47.6	452069	18010	9936	
26	4359x 6.0	* 680x 7.0	* 730x20.0	455.1	47.6	472195	18080	10615	
27	1711x 6.0	* 680x 7.0	* 140x20.0	178.3	47.6	137205	6744	2730	
28	2462x 6.0	* 680x 7.0	* 160x20.0	227.3	47.6	162822	9446	3051	
29	2462x 6.0	* 680x 8.0	* 230x20.0	248.1	54.4	202962	9820	4065	
30	2462x 6.0	* 680x 7.0	* 160x20.0	227.3	47.6	162822	9446	3051	
31	2432x 6.0	* 680x 7.0	* 140x20.0	221.5	47.6	151192	9202	2791	
32	1711x 7.0	* 680x 8.0	* 140x20.0	202.2	54.4	148009	7710	2874	
33	2462x 7.0	* 680x 8.0	* 160x20.0	258.7	54.4	174484	10805	3199	
34	2462x 7.0	* 680x 8.0	* 230x20.0	272.7	54.4	212576	11249	4104	

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(3/3)

MEMBER PROPERTIES

NO. 1 HATCH COVER (AFT) <LYXD>

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No	Top Pl. A x t1 (mm)	Web Pl. D x t2 (mm)	Face Pl. B x t3 (mm)	Sect. Area (cm2)	Web Area (cm2)	Moment of Inertia (cm4)	Sect. Modu. Upp. (cm3)	Sect. Modu. Low (cm3)	Remarks
35	2462x 7.0	* 680x 8.0	* 160x20.0	258.7	54.4	174484	10805	3199	
36	2432x 7.0	* 680x 8.0	* 140x20.0	252.6	54.4	162358	10521	2938	
37	4359x 6.0	* 600x 8.0	* 370x20.0	383.5	48.0	243000	15265	5206	
38	680x 7	L125x75x7	–	61.2	8.3	1032	449	95	
39	680x 7	400x 7	150x20	105.6	28.0	35601	2035	1412	
40	528x 7	603x 12	250x 20	159.3	72.4	103680	3090	3521	
41	528x 7	455x 12	90x 12	102.4	54.6	31497	1792	1056	
42	528x 7	200x 12	90x 12	71.8	24.0	4974	714	333	
43	264x 7	120x 9	90x 14	41.9	10.8	1417	240	173	
44	264x 7	115x 9	90x 14	41.4	10.4	1305	229	165	
45	2180x 7	700x 19	150x 20 / 250x 20 / L100x75x10	382.1	133.0	269903	9932	6201	
46	620x 7	L200x90x9/14	–	77.3	16.7	4788	837	320	

NOTE;~

MEMBERS NUMBERED 101 AND ABOVE SHOWN ON Fig.s 1 AND 2 TO BE COMPOUNDED MEMBER. DETAIL TO BE SHOWN ON ANOTHER DRAWING, "STRENGTH CALCULATION OF STEEL HATCH COVER" (DWG. NO. FA-56003).

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TABLE 6-2. (1/2)

MEMBER PROPERTIES

(NO. 2-6 (FORE) & 5, 6 (AFT) H. COVER <LYK3>)

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Page 1/ 2

No	Top Pl. A x t1 (mm)	Web Pl. D x t2 (mm)	Face Pl. B x t3 (mm)	Sect. Area (cm2)	Web Area (cm2)	Moment of Inertia (cm4)	Sect. Modu. Upp. (cm3)	Sect. Modu. Low (cm3)	Remarks
1	1759 ~~2100~~x 8.0	700x 9.0	L100×75×10	220.2 ~~268.0~~	63.0	144411 ~~127284~~	8093 ~~9681~~	2245 ~~9807~~	
2	480x 8.0	700x 9.0	L100×75×10	116.9	63.0	79461	2841	1855	Do.
3	1201x 8.0	700x 9.0	L100×75×10	174.6	63.0	108823	5770	2095	Do.
4	1711x 8.0	600x10.0	90x20.0	214.9	60.0	101392	7226	2079	
5	1711x 8.0	680x10.0	90x20.0	222.9	68.0	135605	8218	2497	
6	2432x 8.0	600x10.0	90x20.0	272.6	60.0	109845	9854	2127	
7	2432x 8.0	680x10.0	90x20.0	280.6	68.0	147485	11182	2560	
8	2462x 8.0	600x10.0	250x20.0	307.0	60.0	183947	11255	3960	
9	2462x 8.0	680x10.0	250x20.0	315.0	68.0	240369	12756	4626	
10	2462x 8.0	600x10.0	140x20.0	285.0	60.0	134972	10517	2701	
11	2462x 8.0	680x10.0	140x20.0	293.0	68.0	178950	11916	3208	
12	1711x 8.0	680x 8.0	90x20.0	209.3	54.4	125514	8198	2262	
13	2462x 8.0	680x 8.0	90x20.0	269.4	54.4	135896	11339	2311	
14	2462x 8.0	680x 8.0	300x20.0	311.4	54.4	257359	13009	5045	
15	2462x 8.0	680x 8.0	180x20.0	287.4	54.4	192298	12322	3484	
16	2432x 8.0	680x 8.0	90x20.0	267.0	54.4	135570	11214	2309	
17	3780x 8.0	600x 8.0	430x20.0	436.4	48.0	278936	17606	5940	
18	3780x 8.0	680x 8.0	430x20.0	442.8	54.4	360784	19927	6847	

MEMBER PROPERTIES (2/2)

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No.	Top Pl. A × t1 (mm × mm)	Web Pl. D × t2 (mm × mm)	Face Pl. B × t3 (mm × mm)	Sect. Area (cm²)	Web Area (cm²)	Moment of Inertia (cm⁴)	Sect. Modulus Upper (cm³)	Sect. Modulus Lower (cm³)	Remark
19	800 × 8	400 × 7	150×20	1220	28.0	39870	2612	1448	
20	528 × 8	603 × 12	250× 20	164.6	72.4	109450	3360	3585	
21	528 × 8	455 × 12	90× 12	107.6	54.6	33057	1967	1077	
22	528 × 8	200 × 12	90 × 12	77.0	24.0	5216	792	338	
23	264 × 8	160 × 9	90 × 14	48.1	14.4	2659	360	246	
24	264 × 8	135 × 9	90× 14	45.9	12.2	1896	301	202	
25	1759 × 8	700 × 19	130× 20, 250× 20, L100×75×10	370.2	133.0	261471	9299	6126	
26	800 × 8	L150×90×9	—	84.9	12.7	2207	742	172	

TABLE 6-3 (1/2)

NO. 1 (A) STEEL HATCH COVER — GRID ONLY

***** EXTERNAL JOINT DISPLACEMENTS ***** — HC01 - L1AS . GRID (PAGE 1)

$JOI. GROUP	SUPPORT	JOINT	X-DISP.	Y-DISP.	Z-DISP. (cm)	X-ROTATION (rad.)	Y-ROTATION (rad.)	Z-ROTATION
		1	0.0	0.0	-0.45409928	0.00110632	0.00043828	0.0
		2	0.0	0.0	-0.34813646	0.00109499	0.00109884	0.0
		3	0.0	0.0	-0.09718994	0.00089383	0.00113190	0.0
		4	0.0	0.0	0.05422059	0.00023249	0.00063154	0.0
		5	0.0	0.0	0.06187595	-0.00014933	0.00072509	0.0
		6	0.0	0.0	-0.03709603	-0.00056332	0.00055246	0.0
		7	0.0	0.0	-0.18298559	-0.00062774	0.00018893	0.0
		8	0.0	0.0	-0.19062418	0.0	0.00018728	0.0
		9	0.0	0.0	-0.20453846	0.0	0.00017644	0.0
		10	0.0	0.0	-0.61552932	0.00056068	0.00019050	0.0
		11	0.0	0.0	-0.56172684	0.00055815	0.00000282	0.0
		12	0.0	0.0	-0.42979533	0.00049809	0.00041123	0.0
		13	0.0	0.0	-0.32498956	0.00033209	0.00056657	0.0
		14	0.0	0.0	-0.26898709	0.00013301	0.00044836	0.0
		15	0.0	0.0	-0.25203712	0.00002401	0.00028874	0.0
		16	0.0	0.0	-0.25061679	-0.00000294	0.00007893	0.0
		17	0.0	0.0	-0.25933224	0.0	0.00003388	0.0
		18	0.0	0.0	-0.25933224	0.0	-0.00003388	0.0
		19	0.0	0.0	-0.61552932	0.00056068	-0.00019050	0.0
		20	0.0	0.0	-0.56172684	0.00055815	-0.00000282	0.0
		21	0.0	0.0	-0.42979533	0.00049809	-0.00041123	0.0
		22	0.0	0.0	-0.32498956	0.00033209	-0.00056657	0.0
		23	0.0	0.0	-0.26898709	0.00013301	-0.00044836	0.0
		24	0.0	0.0	-0.25203712	0.00002401	-0.00028874	0.0
		25	0.0	0.0	-0.25061679	-0.00000294	-0.00007893	0.0
		26	0.0	0.0	-0.20453846	0.0	-0.00017644	0.0
		27	0.0	0.0	-0.19062418	0.0	-0.00018728	0.0
		28	0.0	0.0	-0.48370589	0.00063878	-0.00042969	0.0
		29	0.0	0.0	-0.42280240	0.00061547	-0.00109665	0.0
		30	0.0	0.0	-0.16953082	0.00181894	-0.00077166	0.0
		31	0.0	0.0	0.00861680	-0.00180194	-0.00079337	0.0
		32	0.0	0.0	0.01232290	-0.00055830	-0.00073526	0.0
		33	0.0	0.0	-0.07443835	-0.00037727	-0.00054336	0.0
		34	0.0	0.0	-0.19572888	-0.00050507	-0.00018442	0.0
		35	0.0	0.0	0.06160099	0.00016701	0.00077021	0.0
		36	0.0	0.0	0.06918651	0.00005139	0.00075490	0.0
		37	0.0	0.0	0.06999399	-0.00001057	0.00067644	0.0
		38	0.0	0.0	-0.48370589	0.00063878	0.00042969	0.0
		39	0.0	0.0	-0.42280240	0.00061547	0.00109665	0.0
		40	0.0	0.0	-0.16953082	0.00181894	0.00077166	0.0
		41	0.0	0.0	0.07274425	-0.00101994	0.00115911	0.0
		42	0.0	0.0	0.00861680	-0.00180194	0.00079337	0.0
		43	0.0	0.0	0.02362722	0.00046665	0.00069553	0.0
		44	0.0	0.0	0.03588416	0.00005198	0.00044606	0.0
		45	0.0	0.0	0.01232290	-0.00055830	0.00073526	0.0
		46	0.0	0.0	-0.07443835	-0.00037727	0.00054336	0.0
		47	0.0	0.0	-0.19572888	-0.00050507	0.00018442	0.0
		48	0.0	0.0	-0.51217576	0.00000866	0.00040516	0.0
		49	0.0	0.0	-0.49724950	0.00044043	0.00109307	0.0
		50	0.0	0.0	-0.22144056	0.00127777	0.00075251	0.0
		51	0.0	0.0	-0.04710116	0.00006909	0.00259061	0.0
		52	0.0	0.0	-0.04716834	0.00009316	0.00085182	0.0
		53	0.0	0.0	-0.04279699	0.00013697	0.00076287	0.0

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NO. 1 (A) STEEL HATCH COVER — GRID ONLY

***** EXTERNAL JOINT DISPLACEMENTS ***** — HC01 - L1AS . GRID (PAGE 2)

$JOI. GROUP	SUPPORT	JOINT	X-DISP.	Y-DISP.	Z-DISP. (cm)	X-ROTATION (rad.)	Y-ROTATION (rad.)	Z-ROTATION
		54	0.0	0.0	-0.03312988	0.00011624	0.00074757	0.0
		55	0.0	0.0	-0.02982004	0.00004141	0.00083086	0.0
		56	0.0	0.0	-0.03017308	-0.00006540	0.00169266	0.0
		57	0.0	0.0	-0.03843635	-0.00016851	0.00075933	0.0
		58	0.0	0.0	-0.11068497	-0.00039386	0.00052072	0.0
		59	0.0	0.0	-0.20789687	-0.00034634	0.00017241	0.0
		60	0.0	0.0	-0.51217576	0.00000866	-0.00040516	0.0
		61	0.0	0.0	-0.49724950	0.00044043	-0.00109307	0.0
		62	0.0	0.0	-0.22144056	0.00127777	-0.00075251	0.0
		63	0.0	0.0	-0.04710116	0.00006909	-0.00259061	0.0
		64	0.0	0.0	-0.04716834	0.00009316	-0.00085182	0.0
		65	0.0	0.0	-0.04279699	0.00013697	-0.00076287	0.0
		66	0.0	0.0	-0.03312988	0.00011624	-0.00074757	0.0
		67	0.0	0.0	-0.02982004	0.00004141	-0.00083086	0.0
		68	0.0	0.0	-0.03017308	-0.00006540	-0.00169266	0.0
		69	0.0	0.0	-0.03843635	-0.00016851	-0.00075933	0.0
		70	0.0	0.0	-0.11068497	-0.00039386	-0.00052072	0.0
		71	0.0	0.0	-0.20789687	-0.00034634	-0.00017241	0.0
		72	0.0	0.0	0.07274425	-0.00101994	-0.00115911	0.0
		73	0.0	0.0	0.02362722	0.00046665	-0.00069553	0.0
		74	0.0	0.0	0.03588416	0.00005198	-0.00044606	0.0
		75	0.0	0.0	-0.45409928	0.00110632	-0.00043828	0.0
		76	0.0	0.0	-0.34813646	0.00109499	-0.00109884	0.0
		77	0.0	0.0	-0.09718994	0.00089383	-0.00113190	0.0
		78	0.0	0.0	0.05422059	0.00023249	-0.00063154	0.0
		79	0.0	0.0	0.06160099	0.00016701	-0.00077021	0.0
		80	0.0	0.0	0.06918651	0.00005139	-0.00075490	0.0
		81	0.0	0.0	0.06999399	-0.00001057	-0.00067644	0.0
		82	0.0	0.0	0.06187595	-0.00014933	-0.00072509	0.0
		83	0.0	0.0	-0.03709603	-0.00056332	-0.00055246	0.0
		84	0.0	0.0	-0.18298559	-0.00062774	-0.00018893	0.0
	(001000)	85	0.0	0.0	0.0	0.0	0.00215896	0.0
	(001000)	86	0.0	0.0	0.0	0.0	0.00131674	0.0
	(001000)	87	0.0	0.0	0.0	0.0	-0.00215896	0.0
	(001000)	88	0.0	0.0	0.0	0.0	-0.00131674	0.0

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SJOI. GROUP	SUPPORT	JOINT	X-DISP.	Y-DISP.	Z-DISP.	X-ROTATION	Y-ROTATION	Z-ROTATION
		53	0.0	0.0	-0.13821046	-0.00030337	0.00068374	0.0

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NO.2-6 (F) & 5,6 (A) STEEL HATCH COVER GRID ONLY

HC01 * L2FS , GRID (PAGE 2)

***** EXTERNAL JOINT DISPLACEMENTS *****

SJOI. GROUP	SUPPORT	JOINT	X-DISP.	Y-DISP.	Z-DISP. (cm)	X-ROTATION (rad.)	Y-ROTATION (rad.)	Z-ROTATION
		54	0.0	0.0	-0.42226567	-0.00148073	0.00095828	0.0
		55	0.0	0.0	-0.74117767	-0.00121060	0.00083728	0.0
		56	0.0	0.0	-1.06421183	0.00184918	-0.00070276	0.0
		57	0.0	0.0	-0.88576387	0.00186703	-0.00082615	0.0
		58	0.0	0.0	-0.41241461	0.00192596	-0.00084769	0.0
		59	0.0	0.0	-0.10053325	-0.00000270	-0.00056732	0.0
		60	0.0	0.0	-0.10127452	-0.00003835	-0.00063252	0.0
		61	0.0	0.0	-0.10682043	-0.00012462	-0.00070946	0.0
		62	0.0	0.0	-0.11302078	-0.00018721	-0.00105708	0.0
		63	0.0	0.0	-0.13821046	-0.00030337	-0.00068374	0.0
		64	0.0	0.0	-0.42226567	-0.00148073	-0.00095828	0.0
		65	0.0	0.0	-0.74117767	-0.00121060	-0.00083728	0.0
		66	0.0	0.0	-0.00831587	-0.00039766	-0.00050081	0.0
		67	0.0	0.0	-0.04036472	0.00017314	-0.00060923	0.0
		68	0.0	0.0	-0.03835069	-0.00015101	-0.00126759	0.0
		69	0.0	0.0	-0.94574808	0.00209342	-0.00075904	0.0
		70	0.0	0.0	-0.74501895	0.00207916	-0.00090974	0.0
		71	0.0	0.0	-0.27156531	0.00164448	-0.00089523	0.0
		72	0.0	0.0	-0.03240378	0.00065500	0.00100944	0.0
		73	0.0	0.0	-0.00875303	0.00032983	-0.00057157	0.0
		74	0.0	0.0	0.00123540	0.00021010	-0.00064536	0.0
		75	0.0	0.0	0.00800006	-0.00001712	-0.00072230	0.0
		76	0.0	0.0	0.00469863	-0.00014816	-0.00054393	0.0
		77	0.0	0.0	-0.00144258	-0.00024905	0.00025081	0.0
		78	0.0	0.0	-0.02550060	-0.00044810	-0.00071300	0.0
		79	0.0	0.0	-0.26026652	-0.00129627	-0.00104224	0.0
		80	0.0	0.0	-0.59932157	-0.00146816	-0.00091187	0.0
	(001000)	81	0.0	0.0	0.0	0.0	-0.00036638	0.0
	(001000)	82	0.0	0.0	0.0	0.0	0.00039572	0.0
	(001000)	83	0.0	0.0	0.0	0.0	0.00036638	0.0
	(001000)	84	0.0	0.0	0.0	0.0	-0.00039572	0.0

TABLE 6-4 (1/2)

NO.2-6 (F) & 5,6 (A) STEEL HATCH COVER GRID ONLY

HC01 * L2FS , GRID (PAGE 1)

***** EXTERNAL JOINT DISPLACEMENTS *****

SJOI. GROUP	SUPPORT	JOINT	X-DISP.	Y-DISP.	Z-DISP. (cm)	X-ROTATION (rad.)	Y-ROTATION (rad.)	Z-ROTATION
		1	0.0	0.0	-0.94574808	0.00209342	0.00075904	0.0
		2	0.0	0.0	-0.74501895	0.00207916	0.00090974	0.0
		3	0.0	0.0	-0.27156531	0.00164448	0.00089523	0.0
		4	0.0	0.0	-0.00875303	0.00032983	0.00057157	0.0
		5	0.0	0.0	-0.02550060	-0.00044810	0.00071300	0.0
		6	0.0	0.0	-0.26026652	-0.00129627	0.00104224	0.0
		7	0.0	0.0	-0.59932157	-0.00146816	0.00091187	0.0
		8	0.0	0.0	-0.63641154	0.0	0.00090681	0.0
		9	0.0	0.0	-1.23217469	0.00153722	0.00029063	0.0
		10	0.0	0.0	-1.08230035	0.00160980	0.00034713	0.0
		11	0.0	0.0	-0.62086782	0.00197396	0.00037815	0.0
		12	0.0	0.0	-0.24196031	0.00073406	0.00024699	0.0
		13	0.0	0.0	-0.30614407	-0.00107522	0.00028981	0.0
		14	0.0	0.0	-0.65316192	-0.00144376	0.00041225	0.0
		15	0.0	0.0	-0.94006053	-0.00096378	0.00034241	0.0
		16	0.0	0.0	-1.23217469	0.00153722	-0.00029063	0.0
		17	0.0	0.0	-1.08230035	0.00160980	-0.00034713	0.0
		18	0.0	0.0	-0.62086782	0.00197396	-0.00037815	0.0
		19	0.0	0.0	-0.24196031	0.00073406	-0.00024699	0.0
		20	0.0	0.0	-0.30614407	-0.00107522	-0.00028981	0.0
		21	0.0	0.0	-0.65316192	-0.00144376	-0.00041225	0.0
		22	0.0	0.0	-0.94006053	-0.00096378	-0.00034241	0.0
		23	0.0	0.0	-0.63641154	0.0	-0.00090681	0.0
		24	0.0	0.0	-1.00609764	0.00201690	-0.00074515	0.0
		25	0.0	0.0	-0.81709548	0.00186107	-0.00088550	0.0
		26	0.0	0.0	-0.34287718	0.00239346	-0.00088472	0.0
		27	0.0	0.0	-0.05459372	-0.00124697	-0.00057572	0.0
		28	0.0	0.0	-0.08237784	-0.00091641	-0.00070747	0.0
		29	0.0	0.0	-0.34296121	-0.00124452	-0.00101860	0.0
		30	0.0	0.0	-0.67175457	-0.00139043	-0.00089261	0.0
		31	0.0	0.0	-0.03240378	0.00065500	-0.00100944	0.0
		32	0.0	0.0	0.00123540	0.00021010	0.00064536	0.0
		33	0.0	0.0	0.00800006	-0.00001712	0.00072230	0.0
		34	0.0	0.0	0.00469863	-0.00014816	0.00054393	0.0
		35	0.0	0.0	-0.00144258	-0.00024905	-0.00025081	0.0
		36	0.0	0.0	-1.00609764	0.00201690	0.00074515	0.0
		37	0.0	0.0	-0.81709548	0.00186107	0.00088550	0.0
		38	0.0	0.0	-0.34287718	0.00239346	0.00088472	0.0
		39	0.0	0.0	-0.00831587	-0.00039766	0.00050081	0.0
		40	0.0	0.0	-0.05459372	-0.00124697	0.00057572	0.0
		41	0.0	0.0	-0.04036472	0.00017314	0.00060923	0.0
		42	0.0	0.0	-0.03835069	-0.00015101	0.00126759	0.0
		43	0.0	0.0	-0.08237784	-0.00091641	0.00070747	0.0
		44	0.0	0.0	-0.34296121	-0.00124452	0.00101860	0.0
		45	0.0	0.0	-0.67175457	-0.00139043	0.00089261	0.0
		46	0.0	0.0	-1.06421183	0.00184918	0.00070276	0.0
		47	0.0	0.0	-0.88576387	0.00186703	0.00082615	0.0
		48	0.0	0.0	-0.41241461	0.00192596	0.00084769	0.0
		49	0.0	0.0	-0.10053325	-0.00000270	0.00056732	0.0
		50	0.0	0.0	-0.10127452	-0.00003835	0.00063252	0.0
		51	0.0	0.0	-0.10682043	-0.00012462	0.00070946	0.0
		52	0.0	0.0	-0.11302078	-0.00018721	0.00105708	0.0

TABLE 6-7 (1/2) NO. 1 (A) HATCH COVER

No. of MEMBER PROPERTY	MAX. SHEARING STRESS (kg/cm²)	MAX. BENDING STRESS (kg/cm²) UPPER	MAX. BENDING STRESS (kg/cm²) LOWER
1	45.6	119.3	471.5
2	9.1	53.9	71.8
3	6.9	17.4	39.4
5	2.0	2.2	6.1
7	26.4	12.9	45.3
9	48.7	42.0	115.2
11	17.6	14.1	49.6
12	6.6	3.6	11.4
13	8.8	60.6	201.8
14	10.3	119.5	236.6
15	10.0	81.4	202.0
16	8.4	35.5	153.2
18	19.3	13.1	49.0
26	168.2	52.1	88.8
27	7.2	3.3	8.2
28	29.5	54.3	168.2
29	93.9	117.2	283.1
30	61.8	78.8	244.0
31	13.8	28.4	93.6
38	237.1	181.4	857.5
39	139.1	120.2	173.2
42	26.5	58.8	126.1
43	233.3	510.2	707.8
44	611.9	534.7	742.1
45	10.9	103.6	166.0
46	346.1	150.2	392.8
101	6.2	2.2	5.8
102	19.4	5.4	18.4
103	91.5	26.5	72.6
104	31.0	9.3	31.3

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TABLE 6-5

NO. 1 (A) STEEL HATCH COVER GRID ONLY

HC01 * L1AS , GRID (PAGE 12)

***** SUPPORT REACTIONS *****

SJOI.	SUPPORT	JOINT	X-DIR. FORCE	Y-DIR. FORCE	Z-DIR. FORCE (Ton)	X-AXIS MOM.	Y-AXIS MOM.	Z-AXIS MOM.
	(001000)	85	0.0	0.0	8.88400752	0.0	0.0	0.0
	(001000)	86	0.0	0.0	7.73888095	0.0	0.0	0.0
	(001000)	87	0.0	0.0	8.88400752	0.0	0.0	0.0
	(001000)	88	0.0	0.0	7.73888095	0.0	0.0	0.0

TABLE 6

NO.2-6 (F) & 5,6 (A) STEEL HATCH COVER GRID ONLY

HC01 * L2FS , GRID (PAGE 12)

***** SUPPORT REACTIONS *****

SJOI.	SUPPORT	JOINT	X-DIR. FORCE	Y-DIR. FORCE	Z-DIR. FORCE (Ton)	X-AXIS MOM.	Y-AXIS MOM.	Z-AXIS MOM.
	(001000)	81	0.0	0.0	8.83805201	0.0	0.0	0.0
	(001000)	82	0.0	0.0	8.88564517	0.0	0.0	0.0
	(001000)	83	0.0	0.0	8.83805201	0.0	0.0	0.0
	(001000)	84	0.0	0.0	8.88564517	0.0	0.0	0.0

TABLE 6-7 (1/2) No. 1 (A) HATCH COVER

No. of MEMBER PROPERTY	MAX. SHEARING STRESS (kg/cm^2)	MAX. BENDING STRESS (kg/cm^2) UPPER	LOWER
105	25.9	7.6	27.3
106	6.2	2.2	5.8
107	19.4	5.4	18.4
108	91.5	26.5	72.6
109	31.0	9.3	31.3
110	25.9	7.6	27.3
111	11.3	2.2	6.4
112	42.3	23.8	40.5
113	51.2	38.5	65.6
114	26.0	11.5	23.9
115	11.3	2.2	6.4
116	42.3	23.8	40.5
117	51.2	38.5	65.6
118	26.0	11.5	23.9
119	1.8	2.3	5.0
120	1.8	2.3	5.0
121	11.8	23.4	39.8
122	1.8	2.3	5.0
123	1.8	2.3	5.0
124	11.8	23.4	39.8

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TABLE 6-8 (1/2) No. 2-6 (F) & 5.6 (A) HATCH COVER

No. of MEMBER PROPERTY	MAX. SHEARING STRESS (kg/cm^2)	MAX. BENDING STRESS (kg/cm^2) UPPER	LOWER
1	74.6	219.3	790.4
2	12.9	104.0	159.3
3	22.5	85.9	236.6
5	20.9	68.3	224.3
7	26.9	64.2	280.5
9	39.3	63.7	175.6
11	30.0	59.7	221.7
12	4.8	68.3	256.9
13	6.2	60.3	296.0
14	7.2	64.8	167.2
15	6.6	57.7	204.1
16	6.2	66.4	322.6
18	13.0	4.5	13.1
19	33.2	54.6	98.5
22	65.3	155.8	365.0
23	302.8	492.7	721.0
24	371.0	589.2	878.0
25	39.6	194.1	294.6
26	271.1	221.7	956.3
101	33.8	19.1	62.8
102	16.5	6.4	28.2
103	10.7	4.0	11.1
104	10.9	3.8	14.1
105	35.9	14.8	64.6
106	33.8	19.1	62.8
107	16.5	6.4	28.2
108	10.9	4.0	11.1
109	10.9	3.8	14.1
110	35.9	14.8	64.6

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TABLE 6-8 (2/2) No. 2-6 (F) & 5.6 (A) HATCH COVER

No. of MEMBER PROPERTY	MAX. SHEARING STRESS (kg/cm^2)	MAX. BENDING STRESS (kg/cm^2) UPPER	LOWER
111	5.4	0.6	1.4
112	8.6	1.2	3.6
113	5.4	0.6	1.4
114	8.6	1.2	3.6
115	2.3	3.0	7.1
116	2.3	3.0	7.1
117	28.9	62.7	114.6
118	2.3	3.0	7.1
119	2.3	3.0	7.1
120	28.9	62.7	114.6

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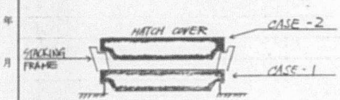
7. STRENGTH CALCULATION OF HATCH COVER IN STACKING

THE CALCULATION TO BE CONDUCTED ABOUT No.s 1 (A) AND 2 (F) HATCH COVER AS TYPICAL ONES.

FOLLOWING CONDITIONS TO BE CONSIDERED IN THIS CALCULATION.

CASE-1 ··· CALCULATION OF HATCH COVER ON HATCH COAMING, STACKING ONE (1) ANOTHER HATCH COVER.

CASE-2 ··· CALCULATION OF HATCH COVER ON STACKING FRAME.



CALCULATION TO BE EXECUTED BY M.H.I. "SANAS-F" (STRUCTURE ANALYSYS PROGRAM BY FINITE ELEMENT METHOD) AND "IBM-3084" ELECTRIC COMPUTER.

CALCULATION MODEL OF EACH HATCH COVER FOR EACH CASE TO BE SHOWN ON Fig.s 7-1-7-4 RESPECTIVELY. MEMBER PROPERTIES IN Fig.s 7-1-7-4 TO BE CALCULATED AS TABLES 7-1 AND 7-2. OUTLINE CONSTRUCTION OF EACH HATCH COVER TO BE SHOWN ON THE FIGURE IN PREVIOUS SECTION.

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RESULTS OF CALCULATION TO BE SHOWN ON TABLES 7-3~7-8 FOR CASE-1 , AND TABLES 7-9~7-14 FOR CASE-2 .

DEFLECTION OF HATCH COVER TO BE SHOWN ON TABLES 7-3, 7-4 AND 7-9, 7-10 AS Z-DISPLACEMENT .

SUPPORT REACTIONS TO BE SHOWN ON TABLES 7-5, 7-6 AND 7-11, 7-12 .

MAXIMUM STRESS IN MEMBERS TO BE SHOWN ON TABLES 7-7, 7-8 AND 7-13, 7-14.

年 月 日 課 係 担当者

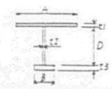
技術資料 D

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TABLE 7-1 (1/3)

MEMBER PROPERTIES

NO. 1 HATCH COVER (AFT) <LYK2>



* MARKED MATERIALS SHOWN HIGHER TENSILE STEEL (AH36).

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No	Top Pl. A x t1 (mm)	Web Pl. D x t2 (mm)	Face Pl. B x t3 (mm)	Sect. Area (cm2)	Web Area (cm2)	Moment of Inertia (cm4)	Sect. Modu. Upp. (cm3)	Sect. Modu. Low (cm3)	Remarks
1	2180x 6.0	700x 9.0	L100x75x10	209.3	63.0	118290	7553	2153	
2	480x 6.0	700x 9.0	L100x75x10	107.3	63.0	71336	2357	1769	Do.
3	1201x 6.0	700x 9.0	L100x75x10	150.6	63.0	99019	4573	2023	Do.
4	1711x 7.0	600x 8.0	*140x20.0	195.8	48.0	112536	6793	2439	
5	1711x 7.0	*680x 7.0	*140x20.0	195.4	47.6	143698	7702	2761	
6	2462x 7.0	*600x 8.0	*160x20.0	252.3	48.0	132722	9546	2720	
7	2462x 7.0	*680x 7.0	*160x20.0	251.9	47.6	169461	10829	3078	
8	2462x 7.0	*600x 8.0	*230x20.0	266.3	48.0	163029	9931	3522	
9	2462x 7.0	*680x 8.0	*230x20.0	272.7	54.4	212576	11249	4104	
10	2462x 7.0	*600x 8.0	*160x20.0	252.3	48.0	132722	9546	2720	
11	2462x 7.0	*680x 7.0	*160x20.0	251.9	47.6	169461	10829	3078	
12	1711x 6.0	*680x 7.0	*80x20.0	166.3	47.6	105986	6313	1970	
13	2462x 6.0	*680x 7.0	*140x20.0	223.3	47.6	151637	9304	2793	
14	2462x 6.0	*680x 7.0	*320x20.0	259.3	47.6	239743	10116	5112	
15	2462x 6.0	*680x 7.0	*230x20.0	241.3	47.6	198985	9814	3954	
16	2462x 6.0	*680x 7.0	*80x20.0	211.3	47.6	115626	8711	2017	
17	2432x 7.0	*600x 8.0	*140x20.0	246.2	48.0	123089	9295	2489	

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MEMBER PROPERTIES

NO. 1 HATCH COVER (AFT) <LYK2>

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No	Top Pl. A x t1 (mm)	Web Pl. D x t2 (mm)	Face Pl. B x t3 (mm)	Sect. Area (cm2)	Web Area (cm2)	Moment of Inertia (cm4)	Sect. Modu. Upp. (cm3)	Sect. Modu. Low (cm3)	Remarks
18	2432x 7.0	*680x 7.0	*140x20.0	245.8	47.6	157144	10547	2816	
19	4359x 6.0	*600x 7.0	*370x20.0	377.5	42.0	239887	15293	5113	
20	4359x 6.0	*680x 7.0	*370x20.0	383.1	47.6	310456	17300	5896	
21	4359x 6.0	*680x 7.0	*446x20.0	398.3	47.6	349468	17546	6895	
22	4359x 6.0	*680x 7.0	*510x20.0	411.1	47.6	380085	17708	7735	
23	4359x 6.0	*680x 7.0	*572x20.0	423.5	47.6	407980	17837	8548	
24	4359x 6.0	*680x 7.0	*626x20.0	434.3	47.6	430977	17931	9255	
25	4359x 6.0	*680x 7.0	*678x20.0	444.7	47.6	452069	18010	9936	
26	4359x 6.0	*680x 7.0	*730x20.0	455.1	47.6	472195	18080	10615	
27	1711x 6.0	*680x 7.0	*140x20.0	178.3	47.6	137205	6744	2730	
28	2462x 6.0	*680x 7.0	*160x20.0	227.3	47.6	162822	9446	3051	
29	2462x 6.0	*680x 8.0	*230x20.0	248.1	54.4	202962	9820	4065	
30	2462x 6.0	*680x 7.0	*160x20.0	227.3	47.6	162822	9446	3051	
31	2432x 6.0	*680x 7.0	*140x20.0	221.5	47.6	151192	9202	2791	
32	1711x 7.0	*680x 8.0	*140x20.0	202.2	54.4	148009	7710	2874	
33	2462x 7.0	*680x 8.0	*160x20.0	258.7	54.4	174484	10805	3199	
34	2462x 7.0	*680x 8.0	*230x20.0	272.7	54.4	212576	11249	4104	

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MEMBER PROPERTIES

NO. 1 HATCH COVER (AFT) <LYK2>

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No	Top Pl. A x t1 (mm)	Web Pl. D x t2 (mm)	Face Pl. B x t3 (mm)	Sect. Area (cm2)	Web Area (cm2)	Moment of Inertia (cm4)	Sect. Modu. Upp. (cm3)	Sect. Modu. Low (cm3)	Remarks
35	2462x 7.0	*680x 8.0	*160x20.0	258.7	54.4	174484	10805	3199	
36	2432x 7.0	*680x 8.0	*140x20.0	252.6	54.4	162358	10521	2938	
37	4359x 6.0	*600x 8.0	*370x20.0	383.5	48.0	243000	15265	5206	

NOTE;

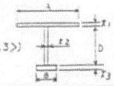
MEMBERS NUMBERED 101 AND ABOVE SHOWN ON Fig.5 AND TO BE COMPOUNDED MEMBER. DETAIL TO BE SHOWN ON ANOTHER DRAWING, " STRENGTH CALCULATION OF STEEL HATCH COVER " (DWG. NO. FA-56003).

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TABLE 7-2.

MEMBER PROPERTIES

(NO. 2-6 (FORE) & 5, 6 (AFT) H. COVER <LYK3>)



Page 1/ 2

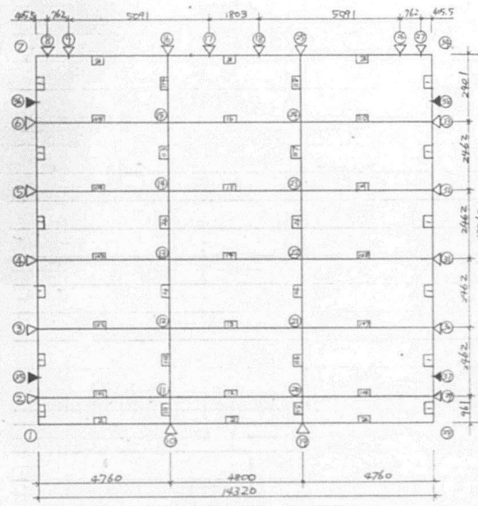
No	Top Pl. A x t1 (mm)	Web Pl. D x t2 (mm)	Face Pl. B x t3 (mm)	Sect. Area (cm2)	Web Area (cm2)	Moment of Inertia (cm4)	Sect. Modu. Upp. (cm3)	Sect. Modu. Low (cm3)	Remarks
1	2180x 8.0	700x 9.0	L100×75×10	252.9	63.0	127254	9681	2207	
2	480x 8.0	700x 9.0	L100×75×10	116.9	63.0	79461	2841	1855	Do.
3	1201x 8.0	700x 9.0	L100×75×10	174.6	63.0	108823	5770	2095	Do.
4	1711x 8.0	600x10.0	90x20.0	214.9	60.0	101392	7226	2079	
5	1711x 8.0	680x10.0	90x20.0	222.9	68.0	135605	8218	2497	
6	2432x 8.0	600x10.0	90x20.0	272.6	60.0	109845	9854	2127	
7	2432x 8.0	680x10.0	90x20.0	280.6	68.0	147485	11182	2560	
8	2462x 8.0	600x10.0	250x20.0	307.0	60.0	183947	11255	3960	
9	2462x 8.0	680x10.0	250x20.0	315.0	68.0	240369	12756	4626	
10	2462x 8.0	600x10.0	140x20.0	285.0	60.0	134972	10517	2701	
11	2462x 8.0	680x10.0	140x20.0	293.0	68.0	178950	11916	3208	
12	1711x 8.0	680x 8.0	90x20.0	209.3	54.4	125514	8198	2262	
13	2462x 8.0	680x 8.0	90x20.0	269.4	54.4	135896	11339	2311	
14	2462x 8.0	680x 8.0	300x20.0	311.4	54.4	257359	13009	5045	
15	2462x 8.0	680x 8.0	180x20.0	287.4	54.4	192298	12322	3484	
16	2432x 8.0	680x 8.0	90x20.0	267.0	54.4	135570	11214	2309	
17	3780x 8.0	600x 8.0	430x20.0	436.4	48.0	278936	17606	5940	
18	3780x 8.0	680x 8.0	430x20.0	442.8	54.4	360784	19927	6847	

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Fig. 7-1 NO. 1 (A) HATCH COVER

CALCULATION MODEL FOR CASE-1

○ No. of JOINT
□ No. of MEMBER PROPERTY
△ SUPPORT (BEARING PAD)
▲ CONCENTRATED LOAD FROM STACKING FRAME (EACH 7.64 TON)



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Fig. 7-2 No. 2-6 (F), 5&6 (A) HATCH COVER

CALCULATION MODEL FOR CASE-1

○ No. of JOINT
□ No. of MEMBER PROPERTY
△ SUPPORT
▲ CONCENTRATED LOAD FROM STACKING FRAME (EACH 7.418 TON)

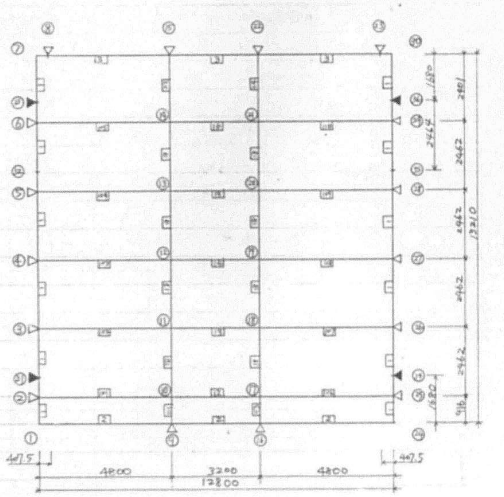


TABLE 7-3

SUPERPOSED CALCULATION
No.1 (A) HATCH COVER CASE-1

SUP1 = (PAGE 87)

***** EXTERNAL JOINT DISPLACEMENTS *****

SJOI. GROUP	SUPPORT	JOINT	X-DISP.	Y-DISP.	Z-DISP. (cm)	X-ROTATION (rad.)	Y-ROTATION (rad.)	Z-ROTATION
		1	0.0	0.0	0.00776279	-0.00007946	0.00003464	0.0
	(001000)	2	0.0	0.0	0.0	-0.00008366	0.00012739	0.0
	(001000)	3	0.0	0.0	0.0	0.00003845	0.00037423	0.0
	(001000)	4	0.0	0.0	0.0	-0.00001373	0.00049830	0.0
	(001000)	5	0.0	0.0	0.0	0.00001646	0.00046876	0.0
	(001000)	6	0.0	0.0	0.0	-0.00005213	0.00027922	0.0
		7	0.0	0.0	-0.00054340	0.00005262	-0.00001568	0.0
	(001000)	8	0.0	0.0	0.0	0.0	-0.00000881	0.0
	(001000)	9	0.0	0.0	0.0	0.0	0.00000476	0.0
	(001000)	10	0.C	0.0	0.0	-0.00048924	0.00000492	0.0
		11	0.0	0.0	-0.04621494	-0.00046547	0.00005871	0.0
		12	0.0	0.0	-0.14261295	-0.00030226	0.00017538	0.0
		13	0.0	0.0	-0.18976847	-0.00007299	0.00022033	0.0
		14	0.0	0.0	-0.17707525	0.00017428	0.00020207	0.0
		15	0.0	0.0	-0.10746946	0.00038100	0.00014403	0.0
	(001000)	16	0.0	0.0	0.0	0.00048629	-0.00000238	0.0
	(001000)	17	0.0	0.0	0.0	0.0	0.00000097	0.0
	(001000)	18	0.0	0.0	0.0	0.0	-0.00000097	0.0
	(001000)	19	0.0	0.0	0.0	-0.00048924	-0.00000492	0.0
		20	0.0	0.0	-0.04621494	-0.00046547	-0.00005871	0.0
		21	0.0	0.0	-0.14261295	-0.00030226	-0.00017538	0.0
		22	0.0	0.0	-0.18976847	-0.00007299	-0.00022033	0.0
		23	0.0	0.0	-0.17707525	0.00017428	-0.00020207	0.0
		24	0.0	0.0	-0.10746946	0.00038100	-0.00014403	0.0
	(001000)	25	0.0	0.0	0.0	0.00048629	0.00000238	0.0
	(001000)	26	0.0	0.0	0.0	0.0	-0.00000476	0.0
	(001000)	27	0.0	0.0	0.0	0.0	0.00000881	0.0
		28	0.0	0.0	0.00776279	-0.00007946	-0.00003464	0.0
	(001000)	29	0.0	0.0	0.0	-0.00008366	-0.00012739	0.0
	(001000)	30	0.0	0.0	0.0	0.00003845	-0.00037423	0.0
	(001000)	31	0.0	0.0	0.0	-0.00001373	-0.00049830	0.0
	(001000)	32	0.0	0.0	0.0	0.00001646	-0.00046876	0.0
	(001000)	33	0.0	0.0	0.0	-0.00005213	-0.00027922	0.0
		34	0.0	0.0	-0.00054340	0.00005262	0.00001568	0.0
		35	0.0	0.0	-0.00498617	-0.00003728	0.0	0.0
		36	0.0	0.0	-0.00411563	-0.00004015	0.0	0.0
		37	0.0	0.0	-0.00498617	-0.00003728	0.0	0.0
		38	0.0	0.0	-0.00411563	-0.00004015	0.0	0.0

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TABLE 7-5

SUPERPOSED CALCULATION
No.1 (A) HATCH COVER CASE-1

SUP1 * (PAGE 93)

***** SUPPORT REACTIONS *****

SJOI. SUPPORT	JOINT	X-DIR.FORCE	Y-DIR.FORCE	Z-DIR.FORCE (Ton)	X-AXIS MOM.	Y-AXIS MOM.	Z-AXIS MOM.
(001000)	2	0.0	0.0	5.90441218	0.0	0.0	0.0
(001000)	3	0.0	0.0	4.55751629	0.0	0.0	0.0
(001000)	4	0.0	0.0	1.23893832	0.0	0.0	0.0
(001000)	5	0.0	0.0	0.57718897	0.0	0.0	0.0
(001000)	6	0.0	0.0	8.06918245	0.0	0.0	0.0
(001000)	8	0.0	0.0	2.68407678	0.0	0.0	0.0
(001000)	9	0.0	0.0	-0.63590049	0.0	0.0	0.0
(001000)	10	0.0	0.0	3.75699348	0.0	0.0	0.0
(001000)	16	0.0	0.0	3.43832273	0.0	0.0	0.0
(001000)	17	0.0	0.0	0.11673735	0.0	0.0	0.0
(001000)	18	0.0	0.0	0.11673735	0.0	0.0	0.0
(001000)	19	0.0	0.0	3.75699348	0.0	0.0	0.0
(001000)	25	0.0	0.0	3.43832273	0.0	0.0	0.0
(001000)	26	0.0	0.0	-0.63590049	0.0	0.0	0.0
(001000)	27	0.0	0.0	2.68407678	0.0	0.0	0.0
(001000)	29	0.0	0.0	5.90441218	0.0	0.0	0.0
(001000)	30	0.0	0.0	4.55751629	0.0	0.0	0.0
(001000)	31	0.0	0.0	1.23893832	0.0	0.0	0.0
(001000)	32	0.0	0.0	0.57718897	0.0	0.0	0.0
(001000)	33	0.0	0.0	8.06918245	0.0	0.0	0.0

TABLE 7-4

SUPERPOSED CALCULATION
No.2-4(F) & 5.6(A) HATCH COVER CASE-1

SUP2 * (PAGE 99)

***** EXTERNAL JOINT DISPLACEMENTS *****

SJOI. GROUP	SUPPORT	JOINT	X-DISP.	Y-DISP.	Z-DISP. (m)	X-ROTATION (rad.)	Y-ROTATION (rad.)	Z-ROTATION
		1	0.0	0.0	0.00687829	-0.00007014	0.00003503	0.0
	(001000)	2	0.0	0.0	0.0	-0.00007471	0.00014287	0.0
	(001000)	3	0.0	0.0	0.0	0.00003451	0.00040992	0.0
	(001000)	4	0.0	0.0	0.0	-0.00001244	0.00053930	0.0
	(001000)	5	0.0	0.0	0.0	0.00001524	0.00050824	0.0
	(001000)	6	0.0	0.0	0.0	-0.00004852	0.00031269	0.0
		7	0.0	0.0	-0.00119525	0.00004423	-0.00003138	0.0
	(001000)	8	0.0	0.0	0.0	0.0	-0.00002520	0.0
	(001000)	9	0.0	0.0	0.0	-0.00050178	-0.00000175	0.0
		10	0.0	0.0	-0.04760151	-0.00048349	0.00004089	0.0
		11	0.0	0.0	-0.14959144	-0.00032282	0.00014964	0.0
		12	0.0	0.0	-0.19957559	-0.00007707	0.00019304	0.0
		13	0.0	0.0	-0.18623775	0.00018455	0.00017753	0.0
		14	0.0	0.0	-0.11200545	0.00040592	0.00010893	0.0
	(001000)	15	0.0	0.0	0.0	0.00049864	0.0000453	0.0
	(001000)	16	0.0	0.0	0.0	-0.00050178	0.00000175	0.0
		17	0.0	0.0	-0.04760151	-0.00048349	-0.00004089	0.0
		18	0.0	0.0	-0.14959144	-0.00032282	-0.00014964	0.0
		19	0.0	0.0	-0.19957559	-0.00007707	-0.00019304	0.0
		20	0.0	0.0	-0.18623775	0.00018455	-0.00017753	0.0
		21	0.0	0.0	-0.11200545	0.00040592	-0.00010893	0.0
	(001000)	22	0.0	0.0	0.0	0.00049864	-0.0000453	0.0
	(001000)	23	0.0	0.0	0.0	0.0	0.00002520	0.0
		24	0.0	0.0	0.00687829	-0.00007014	-0.00003503	0.0
	(001000)	25	0.0	0.0	0.0	-0.00007471	-0.00014287	0.0
	(001000)	26	0.0	0.0	0.0	0.00003451	-0.00040992	0.0
	(001000)	27	0.0	0.0	0.0	-0.00001244	-0.00053930	0.0
	(001000)	28	0.0	0.0	0.0	0.00001524	-0.00050824	0.0
	(001000)	29	0.0	0.0	0.0	-0.00004852	-0.00031269	0.0
		30	0.0	0.0	-0.00119525	0.00004423	0.00003138	0.0
		31	0.0	0.0	-0.00447764	-0.00003366	0.0	0.0
		32	0.0	0.0	0.00122171	0.00001646	0.0	0.0
		33	0.0	0.0	-0.00387819	-0.00003910	0.0	0.0
		34	0.0	0.0	-0.00447764	-0.00003366	0.0	0.0
		35	0.0	0.0	0.00122171	0.00001646	0.0	0.0
		36	0.0	0.0	-0.00387819	-0.00003910	0.0	0.0

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TABLE 7-7 No.1 (A) HATCH COVER (CASE-D)

No. of MEMBER	MAX. SHEARING STRESS (kg/cm²)	MAX. BENDING STRESS (kg/cm²) UPPER	MAX. BENDING STRESS (kg/cm²) LOWER
1	100.2	45.3	159.1
2	3.6	7.5	10.0
3	28.1	15.5	35.0
12	6.6	10.6	34.0
13	8.8	26.9	89.5
14	10.3	47.7	94.3
15	9.6	37.7	93.6
16	8.3	18.7	79.7
26	25.4	55.9	95.1
101	8.6	8.4	20.7
102	18.0	21.5	71.5
103	28.6	43.1	104.2
104	23.2	33.4	103.4
105	14.1	13.3	44.0
106	8.6	8.4	20.7
107	18.0	21.5	71.5
108	28.6	43.1	104.2
109	23.2	33.4	103.4
110	14.1	13.3	44.0
111	69.3	17.7	71.9
112	51.5	44.8	76.4
113	33.0	52.8	90.0
114	72.3	35.9	75.0
115	69.3	17.7	51.9
116	51.5	44.8	76.4
117	33.0	52.8	90.0
118	72.3	35.9	75.0

TABLE 7-6

SUPERPOSED CALCULATION
No.2-4(F) & 5.6(A) HATCH COVER CASE-1

SUP2 * (PAGE 104)

***** SUPPORT REACTIONS *****

SJOI. SUPPORT	JOINT	X-DIR.FORCE	Y-DIR.FORCE	Z-DIR.FORCE (Ton)	X-AXIS MOM.	Y-AXIS MOM.	Z-AXIS MOM.
(001000)	2	0.0	0.0	5.99281953	0.0	0.0	0.0
(001000)	3	0.0	0.0	4.70621558	0.0	0.0	0.0
(001000)	4	0.0	0.0	1.88410600	0.0	0.0	0.0
(001000)	5	0.0	0.0	0.97774053	0.0	0.0	0.0
(001000)	6	0.0	0.0	8.22557331	0.0	0.0	0.0
(001000)	8	0.0	0.0	2.19004009	0.0	0.0	0.0
(001000)	9	0.0	0.0	3.38431364	0.0	0.0	0.0
(001000)	15	0.0	0.0	3.07180447	0.0	0.0	0.0
(001000)	16	0.0	0.0	3.38431364	0.0	0.0	0.0
(001000)	22	0.0	0.0	3.07180447	0.0	0.0	0.0
(001000)	23	0.0	0.0	2.19004009	0.0	0.0	0.0
(001000)	25	0.0	0.0	5.99281953	0.0	0.0	0.0
(001000)	26	0.0	0.0	4.70621558	0.0	0.0	0.0
(001000)	27	0.0	0.0	1.88410600	0.0	0.0	0.0
(001000)	28	0.0	0.0	0.97774053	0.0	0.0	0.0
(001000)	29	0.0	0.0	8.22557331	0.0	0.0	0.0

TABLE 7-8 No. Z-6 (P) & 5,6 (A) HATCH COVER (CASE-1)

No. of MEMBER	MAX. SHEARING STRESS (kg/cm²)	MAX. BENDING STRESS (kg/cm²) UPPER	MAX. BENDING STRESS (kg/cm²) LOWER
1	98.5	34.2	150.1
2	3.8	7.7	11.8
3	27.6	12.1	33.3
12	4.8	9.1	33.0
13	6.2	24.4	119.5
14	7.2	50.9	131.1
15	6.6	37.1	131.2
16	6.2	18.1	88.1
18	38.5	39.9	116.3
101	8.8	9.8	32.3
102	17.4	22.3	97.3
103	31.7	49.4	136.2
104	24.0	35.9	133.5
105	14.9	16.3	71.3
106	8.8	9.8	32.3
107	17.4	22.3	97.3
108	31.7	49.4	136.2
109	24.0	35.9	133.5
110	14.9	16.3	71.3
111	62.4	13.7	39.7
112	56.2	27.5	80.1
113	62.4	13.7	39.7
114	56.2	27.5	80.1

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Fig. 7-3 No. 1 (A) HATCH COVER

CALCULATION MODEL FOR CASE-2

○ No. of JOINT
□ No. of MEMBER PROPERTY
△ SUPPORT

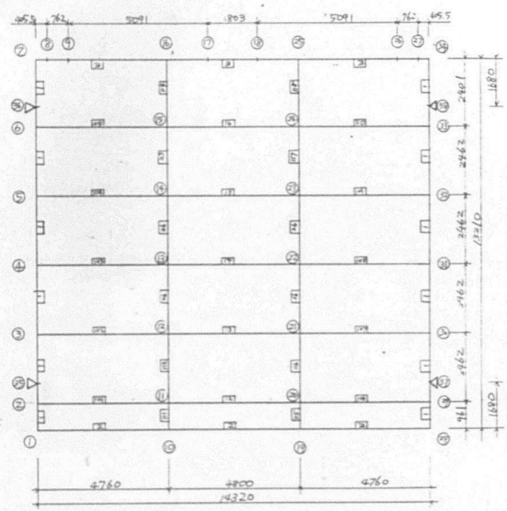


Fig. 7-4 No. Z-6 (P), 5&6 (A) HATCH COVER

CALCULATION MODEL FOR CASE-2

○ No. of JOINT
□ No. of MEMBER PROPERTY
△ SUPPORT

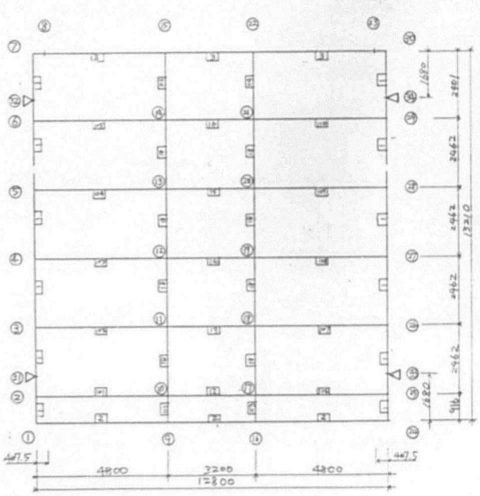


TABLE 7-9

NO. 1 (A) STEEL HATCH COVER　CASE-2　GRID ONLY

HC02 * L1AH . GRID (PAGE 29)

***** EXTERNAL JOINT DISPLACEMENTS *****

S-JOI. GROUP	SUPPORT	JOINT	X-DISP.	Y-DISP.	Z-DISP. (cm)	X-ROTATION (rad.)	Y-ROTATION (rad.)	Z-ROTATION
		1	0.0	0.0	0.12466180	-0.00071579	0.00155300	0.0
		2	0.0	0.0	0.05515140	-0.00073861	0.00138793	0.0
		3	0.0	0.0	-0.14762832	-0.00080603	0.00102447	0.0
		4	0.0	0.0	-0.28444204	-0.00022972	0.00076668	0.0
		5	0.0	0.0	-0.24681744	0.00051627	0.00089983	0.0
		6	0.0	0.0	-0.06204385	0.00087459	0.00130503	0.0
		7	0.0	0.0	0.12695318	0.00071948	0.00178083	0.0
		8	0.0	0.0	0.05483799	0.0	0.00177362	0.0
		9	0.0	0.0	-0.07865844	0.0	0.00172209	0.0
		10	0.0	0.0	-0.48588817	-0.00019829	0.00076727	0.0
		11	0.0	0.0	-0.50482102	-0.00019480	0.00077314	0.0
		12	0.0	0.0	-0.54861464	-0.00015492	0.00050230	0.0
		13	0.0	0.0	-0.57901424	-0.00008882	0.00034395	0.0
		14	0.0	0.0	-0.59177443	-0.00001570	0.00039734	0.0
		15	0.0	0.0	-0.58810802	0.00004141	0.00072918	0.0
		16	0.0	0.0	-0.57398096	0.00006992	0.00088153	0.0
		17	0.0	0.0	-0.66541895	0.0	0.00033535	0.0
		18	0.0	0.0	-0.66541895	0.0	-0.00033535	0.0
		19	0.0	0.0	-0.48588817	-0.00019829	-0.00076727	0.0
		20	0.0	0.0	-0.50482102	-0.00019480	-0.00077314	0.0
		21	0.0	0.0	-0.54861464	-0.00015492	-0.00050230	0.0
		22	0.0	0.0	-0.57901424	-0.00008882	-0.00034395	0.0
		23	0.0	0.0	-0.59177443	-0.00001570	-0.00039734	0.0
		24	0.0	0.0	-0.58810802	0.00004141	-0.00072918	0.0
		25	0.0	0.0	-0.57398096	0.00006992	-0.00088153	0.0
		26	0.0	0.0	-0.07865844	0.0	-0.00172209	0.0
		27	0.0	0.0	0.05483799	0.0	-0.00177362	0.0
		28	0.0	0.0	0.12466180	-0.00071579	-0.00155300	0.0
		29	0.0	0.0	0.05515140	-0.00073861	-0.00138793	0.0
		30	0.0	0.0	-0.14762832	-0.00080603	-0.00102447	0.0
		31	0.0	0.0	-0.28444204	-0.00022972	-0.00076668	0.0
		32	0.0	0.0	-0.24681744	0.00051627	-0.00089983	0.0
		33	0.0	0.0	-0.06204385	0.00087459	-0.00130503	0.0
		34	0.0	0.0	0.12695318	0.00071948	-0.00178083	0.0
	(001000)	35	0.0	0.0	0.0	-0.00080663	0.0	0.0
	(001000)	36	0.0	0.0	0.0	0.00082938	0.0	0.0
	(001000)	37	0.0	0.0	0.0	-0.00080663	0.0	0.0
	(001000)	38	0.0	0.0	0.0	0.00082938	0.0	0.0

TABLE 7-11

NO. 1 (A) STEEL HATCH COVER GRID ONLY CASE-2

HCO2 * L1AH , GRID (PAGE 35)

***** SUPPORT REACTIONS *****

SJOI. SUPPORT	JOINT	X-DIR.FORCE	Y-DIR.FORCE	Z-DIR.FORCE (Ton)	X-AXIS.MOM.	Y-AXIS.MOM.	Z-AXIS.MOM.
(001000)	35	0.0	0.0	7.37574563	0.0	0.0	0.0
(001000)	36	0.0	0.0	7.05172244	0.0	0.0	0.0
(001000)	37	0.0	0.0	7.37574563	0.0	0.0	0.0
(001000)	38	0.0	0.0	7.05172244	0.0	0.0	0.0

TABLE 7-10

.2 - 4 (F) & 5,6 (A) STEEL HATCH COVER GRID ONLY CASE-2

HCO2 * L2FH , GRID (PAGE 20)

***** EXTERNAL JOINT DISPLACEMENTS *****

SJOI. GROUP	SUPPORT	JOINT	X-DISP.	Y-DISP.	Z-DISP. (cm)	X-ROTATION (rad.)	Y-ROTATION (rad.)	Z-ROTATION
		1	0.0	0.0	0.11455686	-0.00065488	0.00128815	0.0
		2	0.0	0.0	0.05088167	-0.00067831	0.00117929	0.0
		3	0.0	0.0	-0.13874231	-0.00076497	0.00083281	0.0
		4	0.0	0.0	-0.26971288	-0.00022282	0.00058215	0.0
		5	0.0	0.0	-0.23436456	0.00049109	0.00069577	0.0
		6	0.0	0.0	-0.05870650	0.00082958	0.00109521	0.0
		7	0.0	0.0	0.11869197	0.00066955	0.00147472	0.0
		8	0.0	0.0	0.05869559	0.0	0.00146749	0.0
		9	0.0	0.0	-0.37351939	-0.00024809	0.00049950	0.0
		10	0.0	0.0	-0.39722827	-0.00024432	0.00047397	0.0
		11	0.0	0.0	-0.45178404	-0.00018735	0.00032650	0.0
		12	0.0	0.0	-0.48560792	-0.00008319	0.00020945	0.0
		13	0.0	0.0	-0.49201534	0.00002988	0.00024930	0.0
		14	0.0	0.0	-0.47315791	0.00011539	0.00043619	0.0
		15	0.0	0.0	-0.44043864	0.00014826	0.00057272	0.0
		16	0.0	0.0	-0.37351939	-0.00024809	-0.00049950	0.0
		17	0.0	0.0	-0.39722827	-0.00024432	-0.00047397	0.0
		18	0.0	0.0	-0.45178404	-0.00018735	-0.00032650	0.0
		19	0.0	0.0	-0.48560792	-0.00008319	-0.00020945	0.0
		20	0.0	0.0	-0.49201534	0.00002988	-0.00024930	0.0
		21	0.0	0.0	-0.47315791	0.00011539	-0.00043619	0.0
		22	0.0	0.0	-0.44043864	0.00014826	-0.00057272	0.0
		23	0.0	0.0	0.05869559	0.0	-0.00146749	0.0
		24	0.0	0.0	0.11455686	-0.00065488	-0.00128815	0.0
		25	0.0	0.0	0.05088167	-0.00067831	-0.00117929	0.0
		26	0.0	0.0	-0.13874231	-0.00076497	-0.00083281	0.0
		27	0.0	0.0	-0.26971288	-0.00022282	-0.00058215	0.0
		28	0.0	0.0	-0.23436456	0.00049109	-0.00069577	0.0
		29	0.0	0.0	-0.05870650	0.00082958	-0.00109521	0.0
		30	0.0	0.0	0.11869197	0.00066955	-0.00147472	0.0
	(001000)	31	0.0	0.0	0.0	-0.00074859	0.0	0.0
	(001000)	32	0.0	0.0	0.0	0.00078187	0.0	0.0
	(001000)	33	0.0	0.0	0.0	-0.00074859	0.0	0.0
	(001000)	34	0.0	0.0	0.0	0.00078187	0.0	0.0

TABLE 7-13 No.1 (A) HATCH COVER (CASE-2)

No. of MEMBER	MAX. SHEARING STRESS (kg/cm²)	MAX. BENDING STRESS (kg/cm²) UPPER	MAX. BENDING STRESS (kg/cm²) LOWER
1	28.4	105.9	371.7
2	18.6	206.5	275.2
3	29.2	169.5	383.1
12	6.6	115.6	370.4
13	8.8	73.6	245.2
14	10.3	73.3	145.1
15	9.6	72.4	179.6
16	8.3	87.0	371.8
26	15.9	16.8	28.7
101	37.6	102.6	253.5
102	37.0	68.2	227.1
103	40.0	69.6	168.1
104	38.1	69.4	214.8
105	39.9	76.3	251.6
106	37.6	102.6	253.5
107	37.0	68.2	227.1
108	40.0	69.6	168.1
109	38.1	69.4	241.8
110	39.9	76.3	251.6
111	11.9	2.4	6.9
112	22.8	11.6	20.5
113	18.9	14.7	25.0
114	23.6	8.4	17.5
115	11.9	2.4	6.9
116	22.8	11.6	20.5
117	18.9	14.7	25.0
118	23.6	8.4	17.5

TABLE 7-12

.2 - 4 (F) & 5,6 (A) STEEL HATCH COVER GRID ONLY CASE-2

HCO2 * L2FH , GRID (PAGE 25)

***** SUPPORT REACTIONS *****

SJOI. SUPPORT	JOINT	X-DIR.FORCE	Y-DIR.FORCE	Z-DIR.FORCE (Ton)	X-AXIS.MOM.	Y-AXIS.MOM.	Z-AXIS.MOM.
(001000)	31	0.0	0.0	7.94760422	0.0	0.0	0.0
(001000)	32	0.0	0.0	7.64900893	0.0	0.0	0.0
(001000)	33	0.0	0.0	7.94760422	0.0	0.0	0.0
(001000)	34	0.0	0.0	7.64900893	0.0	0.0	0.0

827

TABLE 7-14, NO. 2-6 (P) & 5.6 (A) HATCH COVER (CASE-2)

No. of MEMBER	MAX. SHEARING STRESS (kg/cm²)	MAX. BENDING STRESS (kg/cm²)	
		UPPER	LOWER
1	84.2	85.2	373.7
2	20.5	184.8	283.1
3	31.9	143.0	393.9
12	4.8	96.5	349.6
13	6.2	52.2	256.1
14	7.2	55.1	142.1
15	6.6	51.8	183.1
16	6.2	70.2	341.1
18	23.7	18.0	52.3
101	33.7	93.7	303.3
102	28.4	50.5	220.6
103	33.7	53.8	148.2
104	48.4	51.1	189.8
105	35.2	68.0	297.2
106	33.7	93.7	303.3
107	28.4	50.5	220.6
108	33.7	53.8	148.2
109	48.4	51.1	189.8
110	35.2	68.0	297.2
111	14.6	2.6	7.5
112	23.6	8.7	25.2
113	14.6	2.6	7.5
114	23.6	8.7	25.2

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APPROVAL OF OWNER & REGULATORY BODIES

ALT. NO.	OWNER DATE	OWNER LETTER NO.	USCG DATE	USCG LETTER NO.	ABS. DATE	ABS. LETTER NO.	USPH DATE	USPH LETTER NO.
ORIGINAL	7 Aug '85	LFTC/MES-822			30 Aug '85	7-8-2		
1ST REV	4 Nov '86	TAM/104			8 Nov '86	7-8-2		

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SHIPYARD AND SHIP'S NO. & NAME			
MITSUI TAMANO		MITSUBISHI KOBE	
NO.1323	DOCTOR LYKES	NO.1158	JAMES LYKES
NO.1324	ALMERIA LYKES	NO.1159	JOSEPH LYKES
NO.1325	TILLIE LYKES	NO.1164	SOLON TURMAN

MITSUI ENGINEERING & SHIPBUILDING CO., LTD.
TAMANO WORKS

SHIP DESIGN DEPARTMENT
STRUCTURE DESIGN SEC.

SHIP'S NO. 1325 — SHIP'S NAME TILLIE LYKES

独立小甲板室構造
(SMALL HOUSE CONST.)

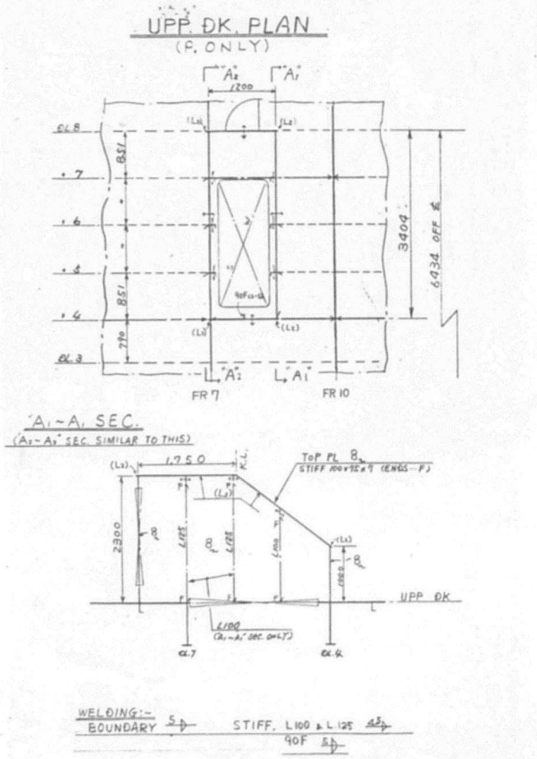
DATE NOV. 14, 1986 (TEL. 22303)
JOB NO. TS1323/24/25 — SCALE 1/50 — LYKES REF. NO. 160210 — MITSUI DRAWING NO. 2105701

(3 SHEETS WITH COVER)

PLAN RECORD

ALT. NO.	MARK	ALTERATION/DESCRIPTION	DATE & SIGNATURE
		"PREPARED FOR S.NO. 1323 AS FINISHED PLAN, MADE APPLICABLE TO S.NO. 1324 AND S.NO. 1325."	NOV. 28. '86

DWG. NO. 2105701 - 1/2



2105701 - 2/2

APPROVAL OF OWNER & REGULATORY BODIES								
ALT. NO.	OWNER		USCG		ABS		USPH	
	DATE	LETTER NO.	DATE	LETTER NO.	DATE	LETTER NO.	DATE	LETTER NO.
ORIGINAL	7 JUN '86	OFTS/MES 606						
1ST PART REV	12 JUN '86	TAM/16						
2ND PART REV	8 SEP '86							
3RD PART REV	7 FEB '86	TAM/108						
4TH PART REV	27 MAR '86	TAM/149						
5TH PART REV	9 SEP '86	—						

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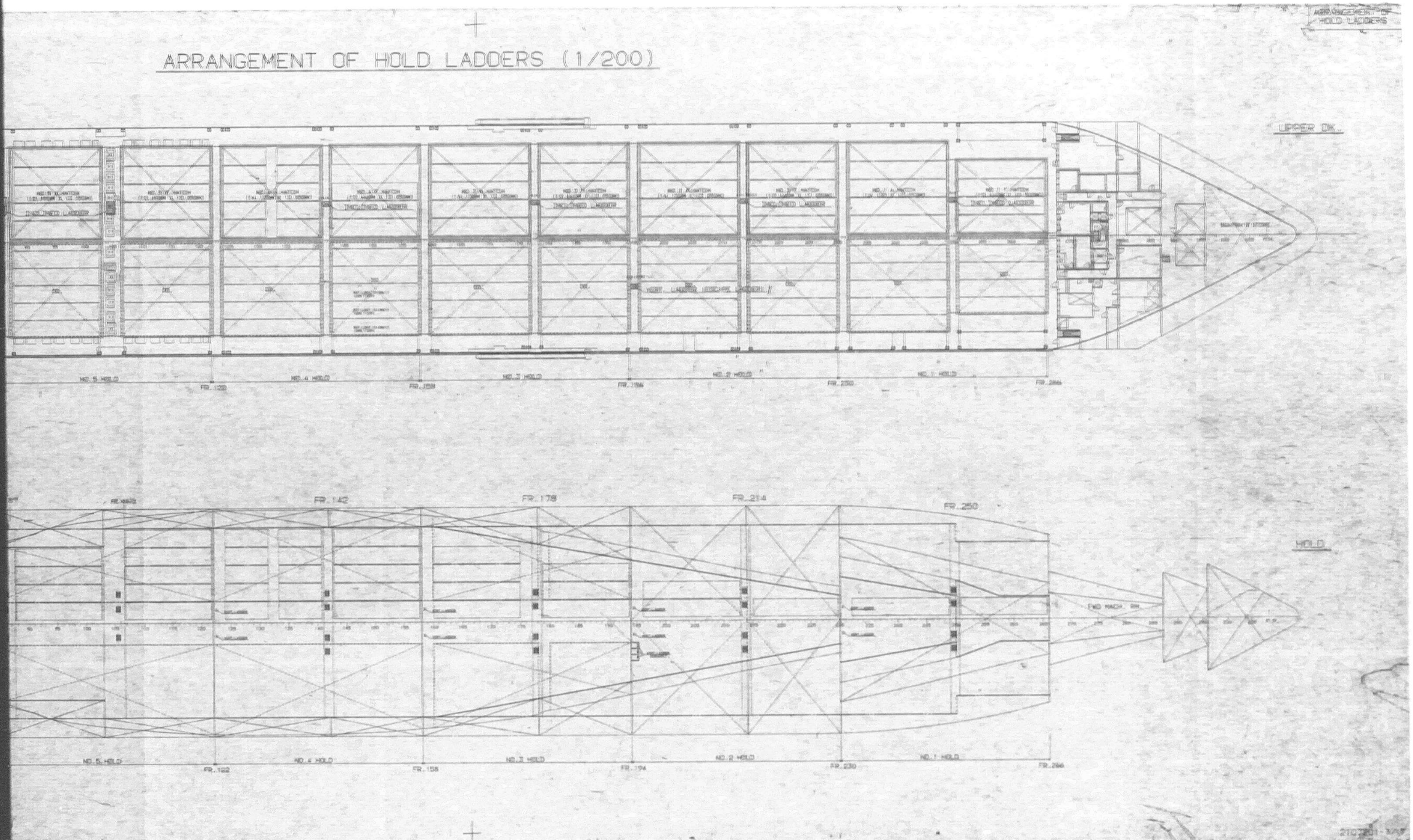
SHIPYARD AND SHIP'S NO. & NAME			
MITSUI TAMANO		MITSUBISHI KOBE	
NO.1323	DOCTOR LYKES	NO.1158	JAMES LYKES
NO.1324	ALMERIA LYKES	NO.1159	JOSEPH LYKES
NO.1325	TILLIE LYKES	NO.1164	SOLON TURMAN

MITSUI ENGINEERING & SHIPBUILDING CO., LTD.
TAMANO WORKS

SHIP DESIGN DEPARTMENT	SHIP'S NO.	SHIP'S NAME
MANAGER	1325	TILLIE LYKES
STRUCTURE DESIGN SEC.	倉内梯子	
SEC. CHIEF / ASST. / CHARGE / STAFF	LADDERS IN HOLDS	
DATE (TEL 26-2250)		
JOB NO. TS1323/24/25 / JOBCLASSIF. NO. — SCALE 1/50	LYKES REF. NO. 160401	MITSUI DRAWING NO. 2107201

(18 SHEETS WITH COVER)

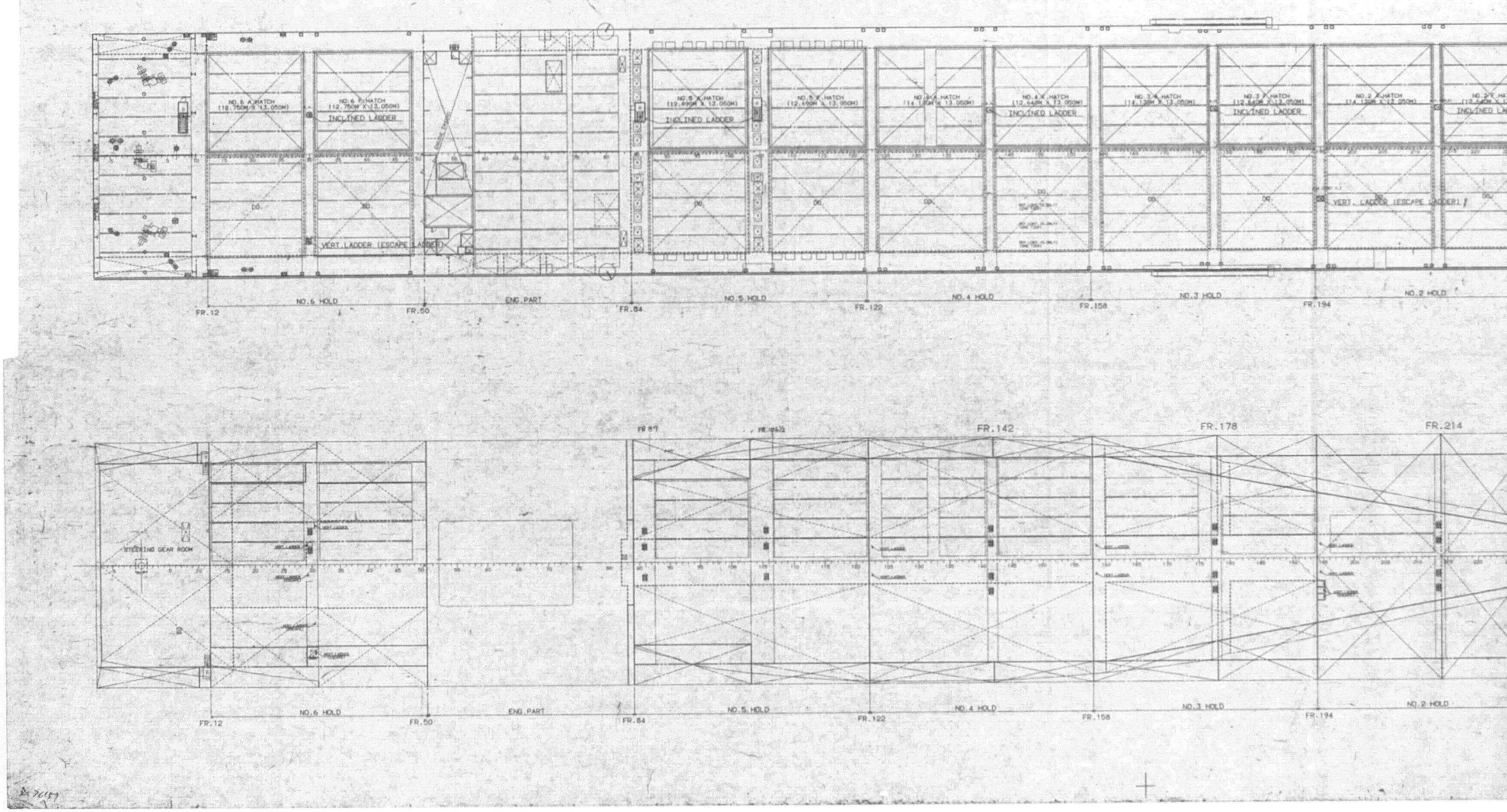
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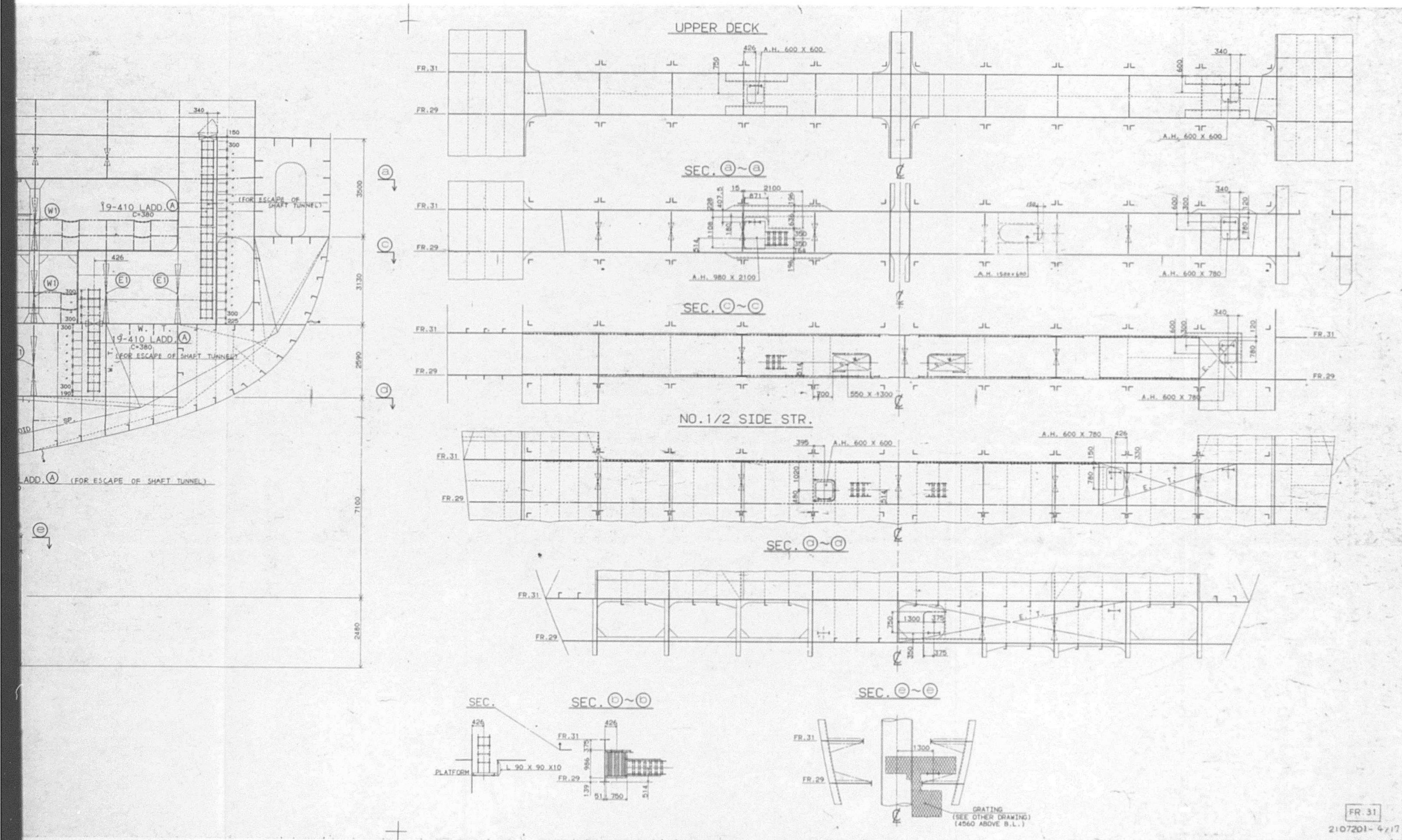
ARRANGEMENT OF HOLD LADDERS (1/200)
ARRANGEMENT OF HOLD LADDERS
UPPER DK.
HOLD
FR.142
FR.178
FR.214
FR.250
FWD MACH. RM

1/2 831

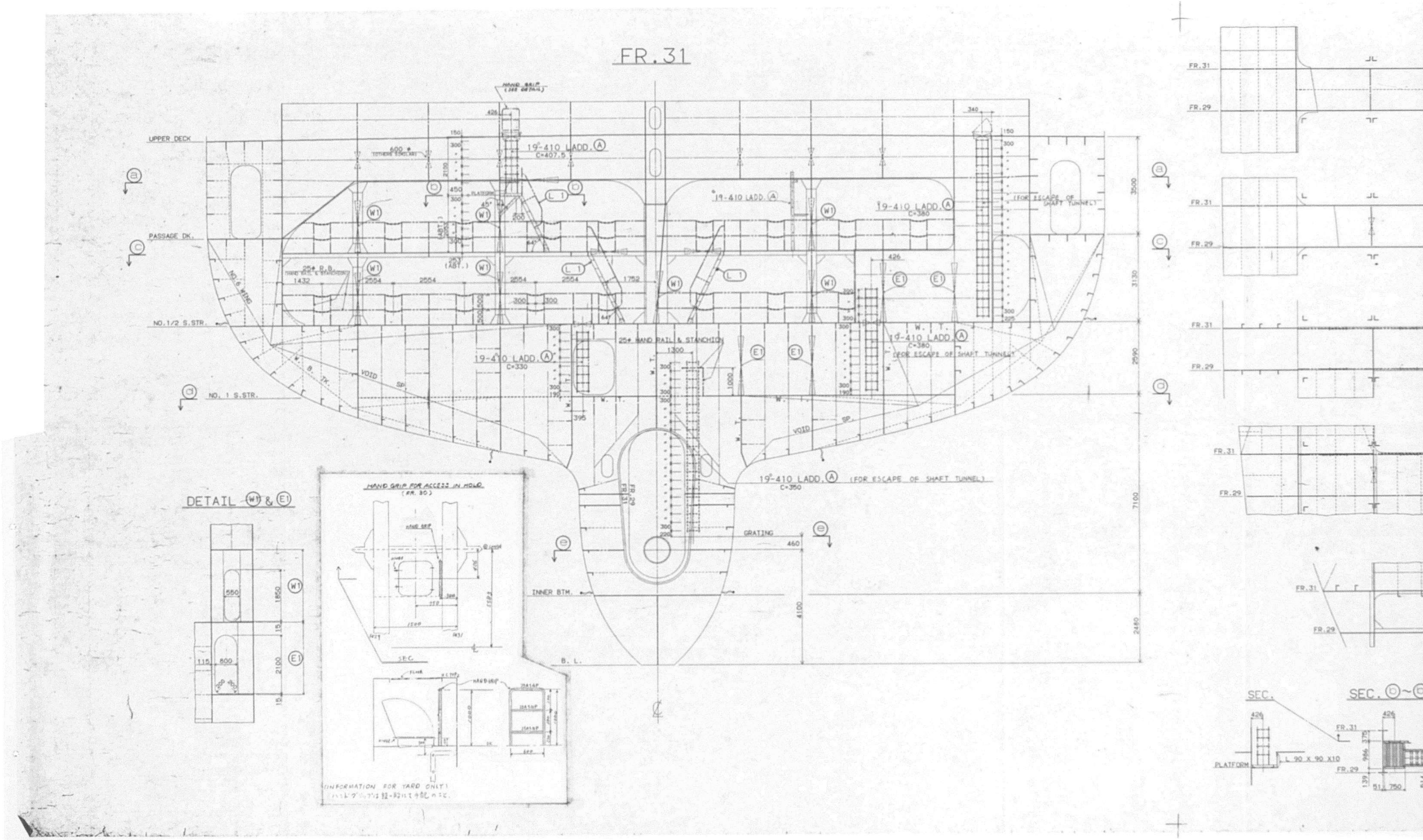
ARRANGEMENT OF HOLD LADDERS (1/200)



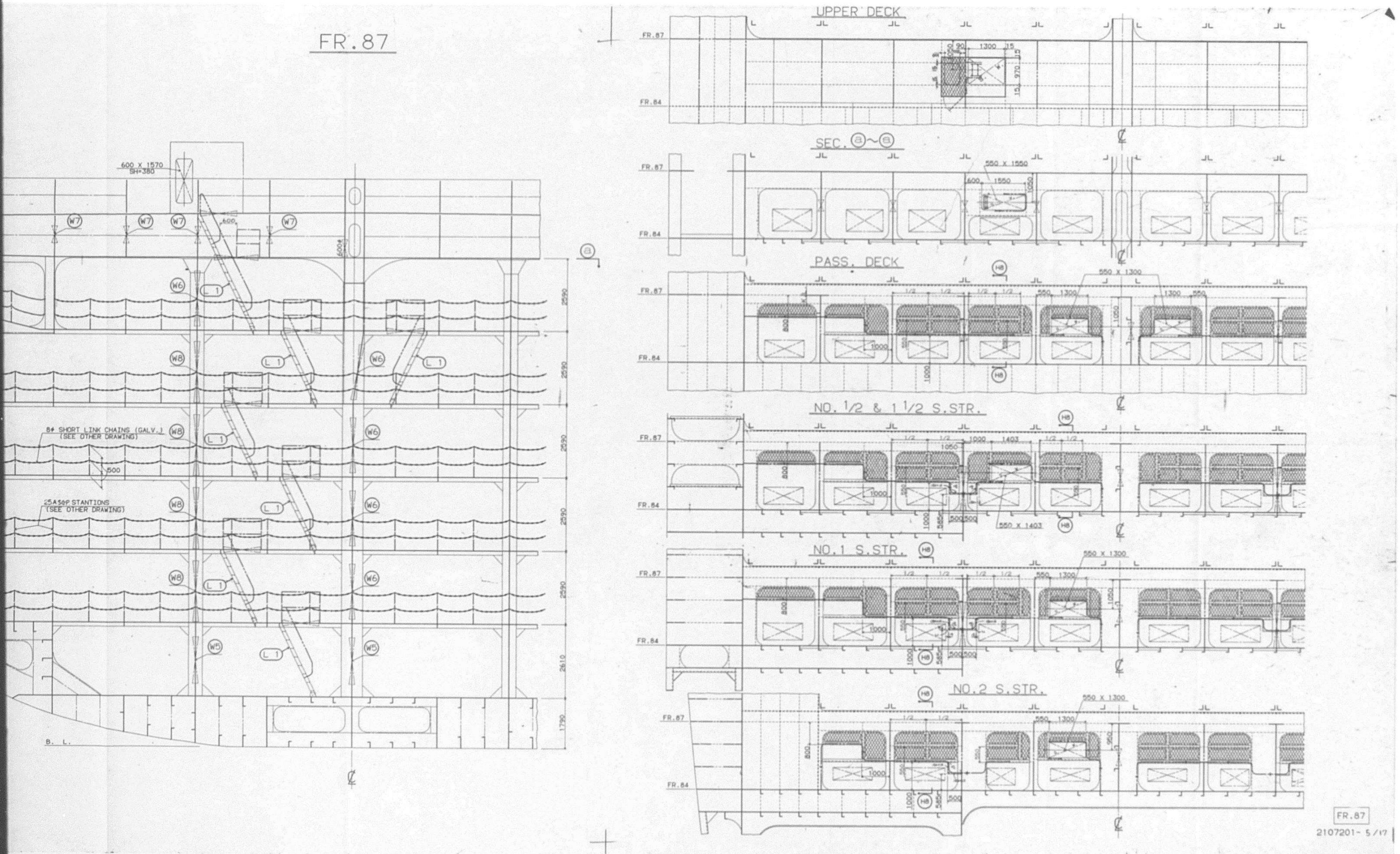
832


UPPER DECK
SEC. ⓐ~ⓐ
SEC. ⓒ~ⓒ
NO.1/2 SIDE STR.
SEC. ⓓ~ⓓ
SEC.
SEC. ⓑ~ⓑ
SEC. ⓔ~ⓔ
FR.31
FR.29
A.H. 600 X 600
A.H. 980 X 2100
A.H. 600 X 780
550 X 1300
19-410 LADD. Ⓐ
C=380
(FOR ESCAPE OF SHAFT TUNNEL)
W. T. T.
PLATFORM
L 90 X 90 X10
GRATING
(SEE OTHER DRAWING)
(4560 ABOVE B.L.)
FR.31
2107201-4/17

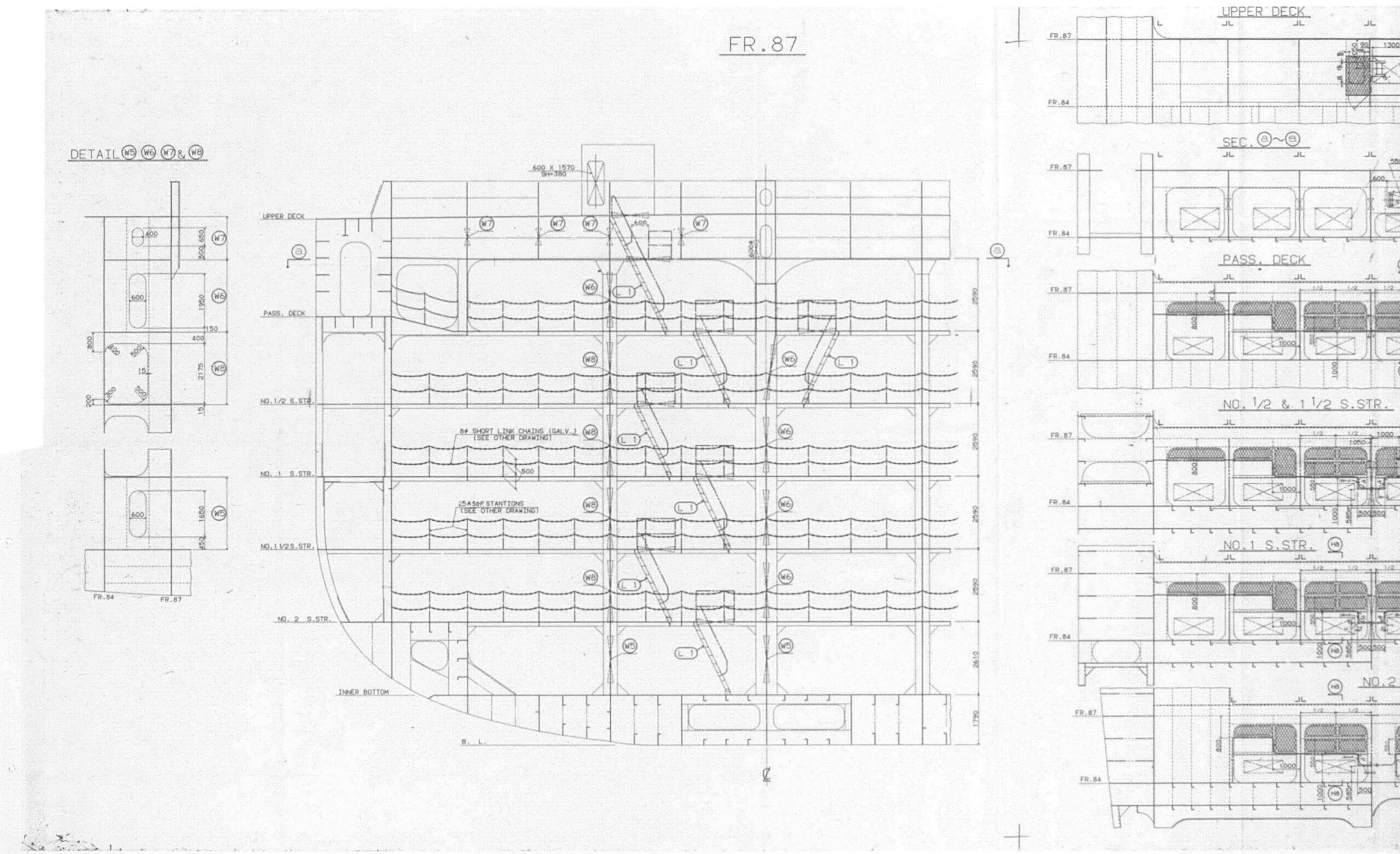
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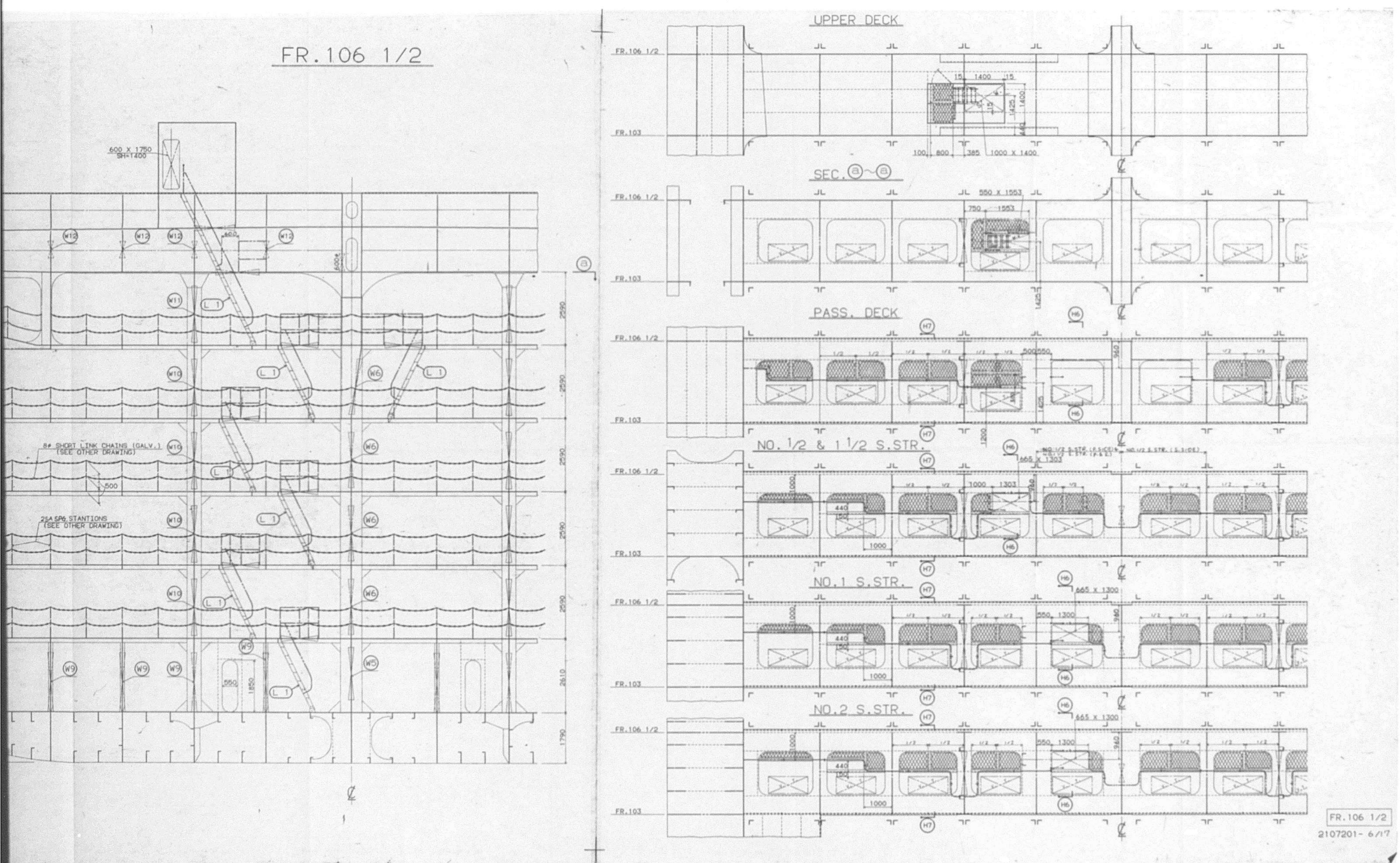
FR.31
UPPER DECK
PASSAGE DK.
NO.1/2 S.STR.
NO. 1 S.STR.
19-410 LADD. A
DETAIL W1 & E1
HAND GRIP FOR ACCESS IN HOLD
INNER BTM.
GRATING
B. L.
(FOR ESCAPE OF SHAFT TUNNEL)
25φ HAND RAIL & STANCHION
SEC.
PLATFORM
L 90 X 90 X10



FR.87
UPPER DECK
SEC. ⓐ~ⓐ
PASS. DECK
NO. 1/2 & 1 1/2 S.STR.
NO.1 S.STR.
NO.2 S.STR.
8φ SHORT LINK CHAINS (GALV.) (SEE OTHER DRAWING)
25A 5/6 P STANTIONS (SEE OTHER DRAWING)
600 X 1570 SH=380
550 X 1550
550 X 1300
550 X 1403
FR.87
2107201- 5/17

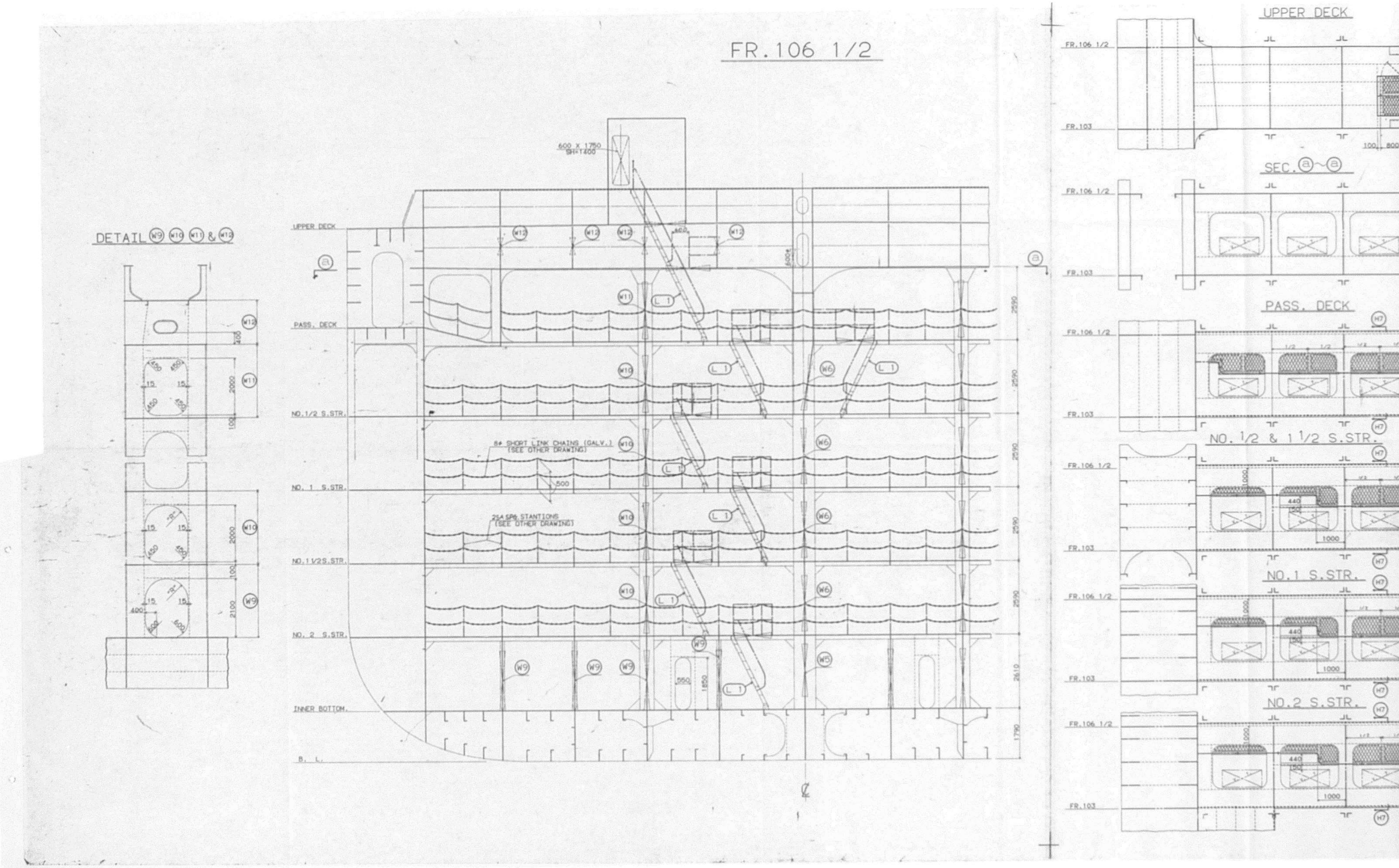

FR. 87
DETAIL W5 W6 W7 & W8
UPPER DECK
PASS. DECK
NO. 1/2 S.STR.
NO. 1 S.STR.
NO. 1 1/2 S.STR.
NO. 2 S.STR.
INNER BOTTOM
B. L.
600 X 1570
SH=380
8φ SHORT LINK CHAINS (GALV.)
(SEE OTHER DRAWING)
25A SGP STANTIONS
(SEE OTHER DRAWING)
FR. 84
FR. 87
UPPER DECK
SEC. a~a
PASS. DECK
NO. 1/2 & 1 1/2 S.STR.
NO. 1 S.STR.

836

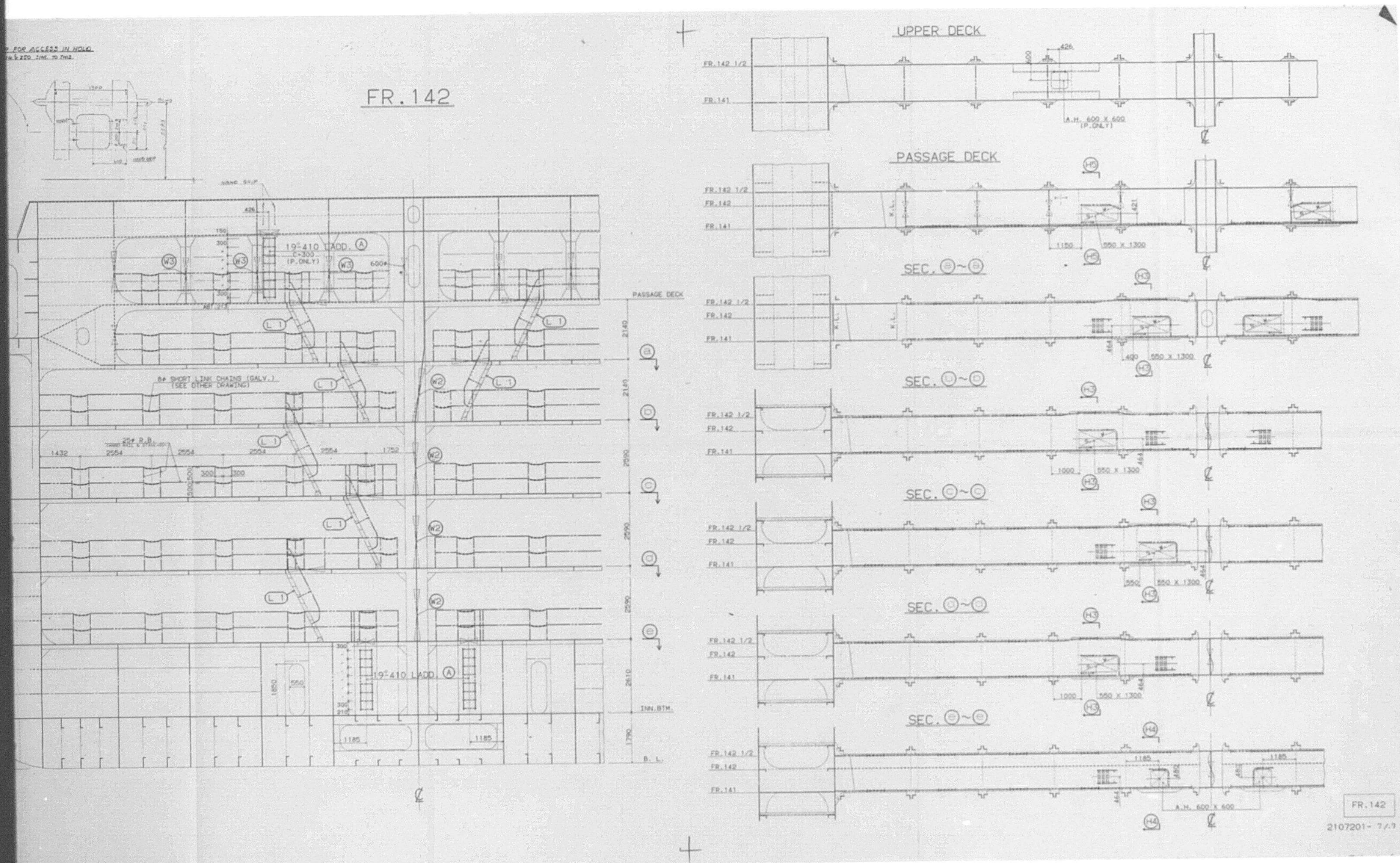


FR.106 1/2
UPPER DECK
SEC. ⓐ~ⓐ
PASS. DECK
NO. 1/2 & 1 1/2 S.STR.
NO.1 S.STR.
NO.2 S.STR.
8ø SHORT LINK CHAINS (GALV.)
(SEE OTHER DRAWING)
25A SP6 STANTIONS
(SEE OTHER DRAWING)
FR.106 1/2
2107201- 6/17

837

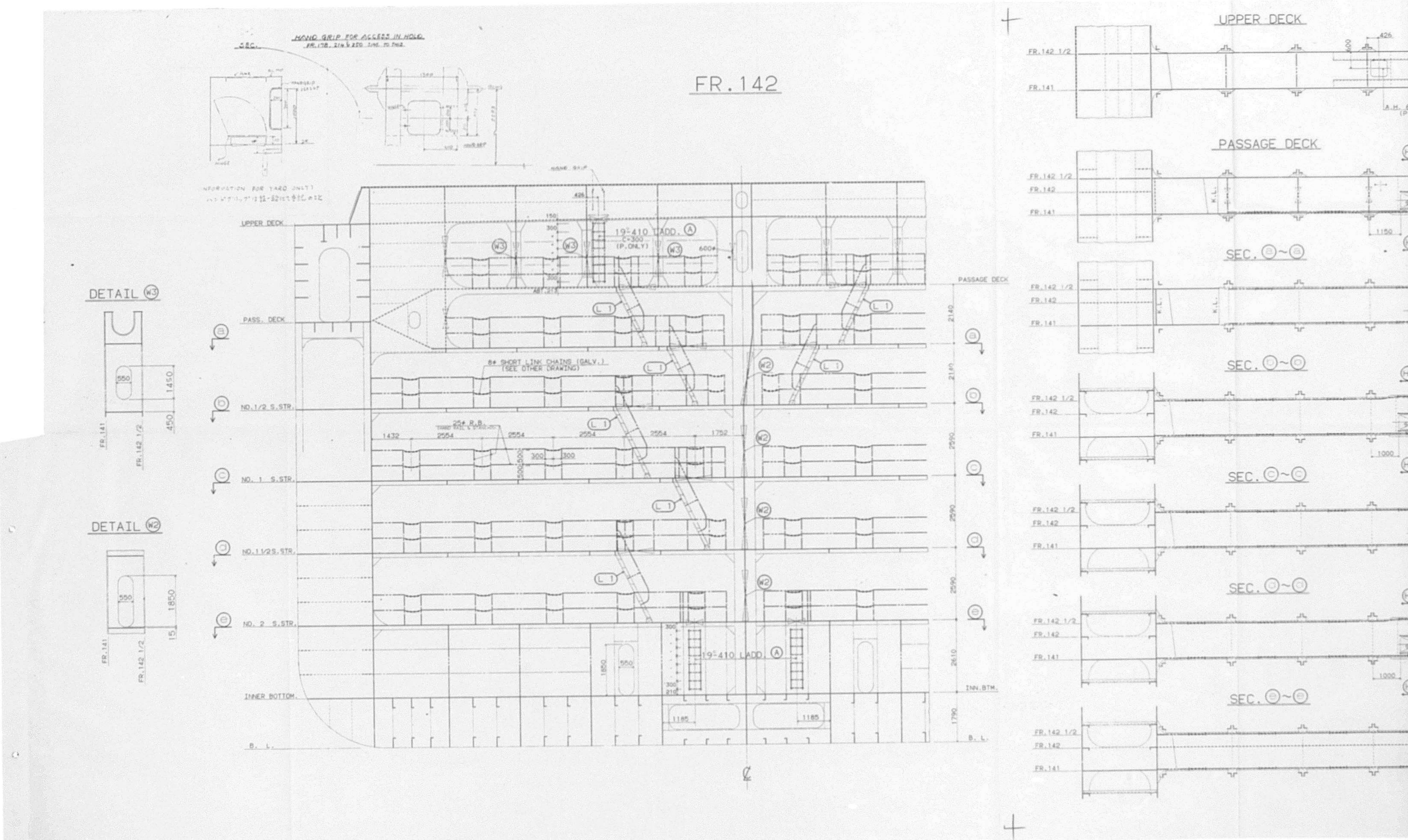

FR.106 1/2
DETAIL W9 W10 W11 & W12
UPPER DECK
PASS. DECK
NO.1/2 S.STR.
NO. 1 S.STR.
NO.1 1/2 S.STR.
NO. 2 S.STR.
INNER BOTTOM
B. L.
UPPER DECK
SEC. a~a
PASS. DECK
NO. 1/2 & 1 1/2 S.STR.
NO.1 S.STR.
NO.2 S.STR.

2/2 838

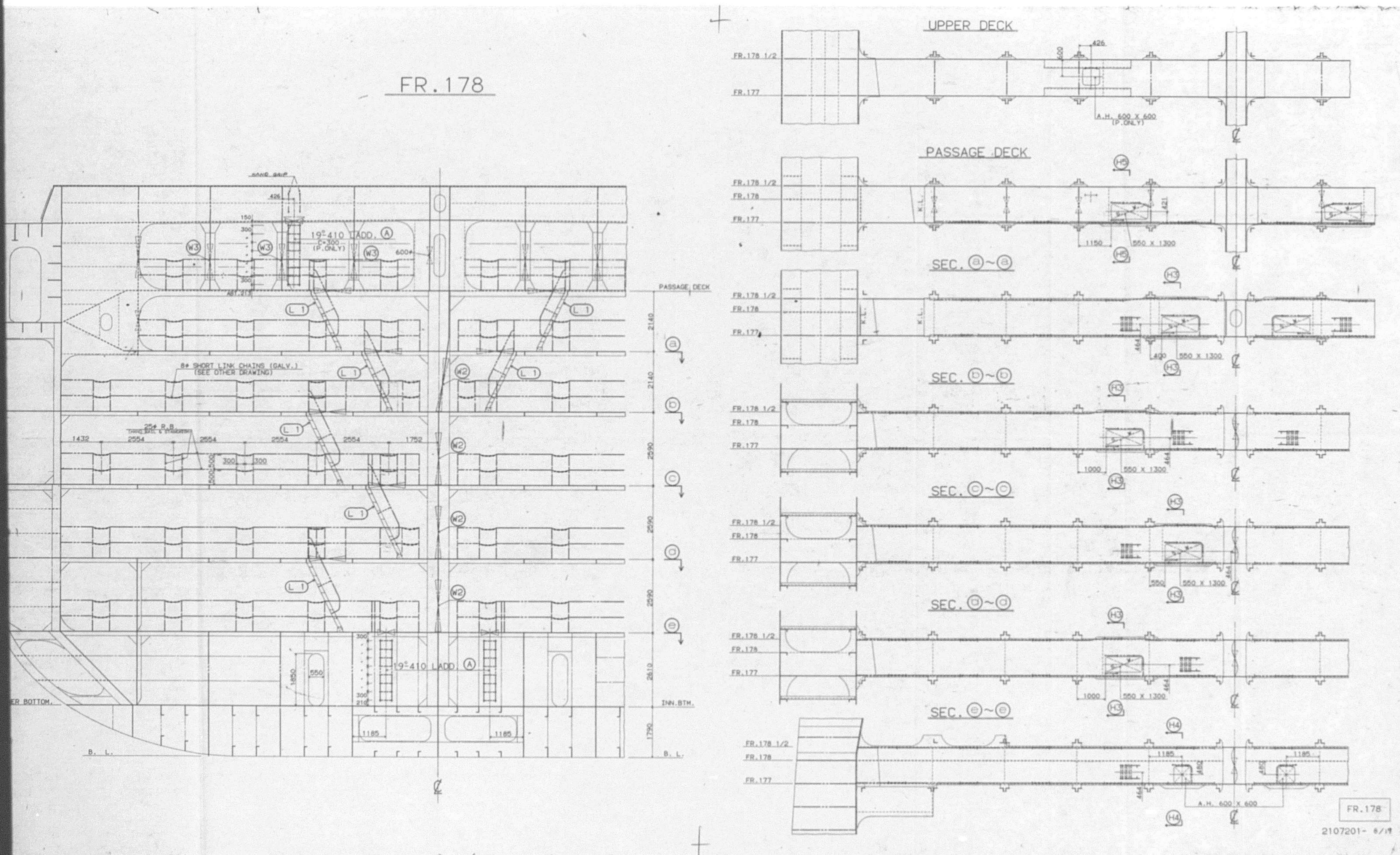


FR.142
UPPER DECK
PASSAGE DECK
SEC. ⓐ~ⓐ
SEC. ⓑ~ⓑ
SEC. ⓒ~ⓒ
SEC. ⓓ~ⓓ
SEC. ⓔ~ⓔ
FR.142 1/2
FR.142
FR.141
A.H. 600 X 600 (P.ONLY)
550 X 1300
19^t 410 LADD. Ⓐ
8φ SHORT LINK CHAINS (GALV.) (SEE OTHER DRAWING)
25φ R.B.
PASSAGE DECK
INN.BTM.
B.L.
2107201- 7/7

839

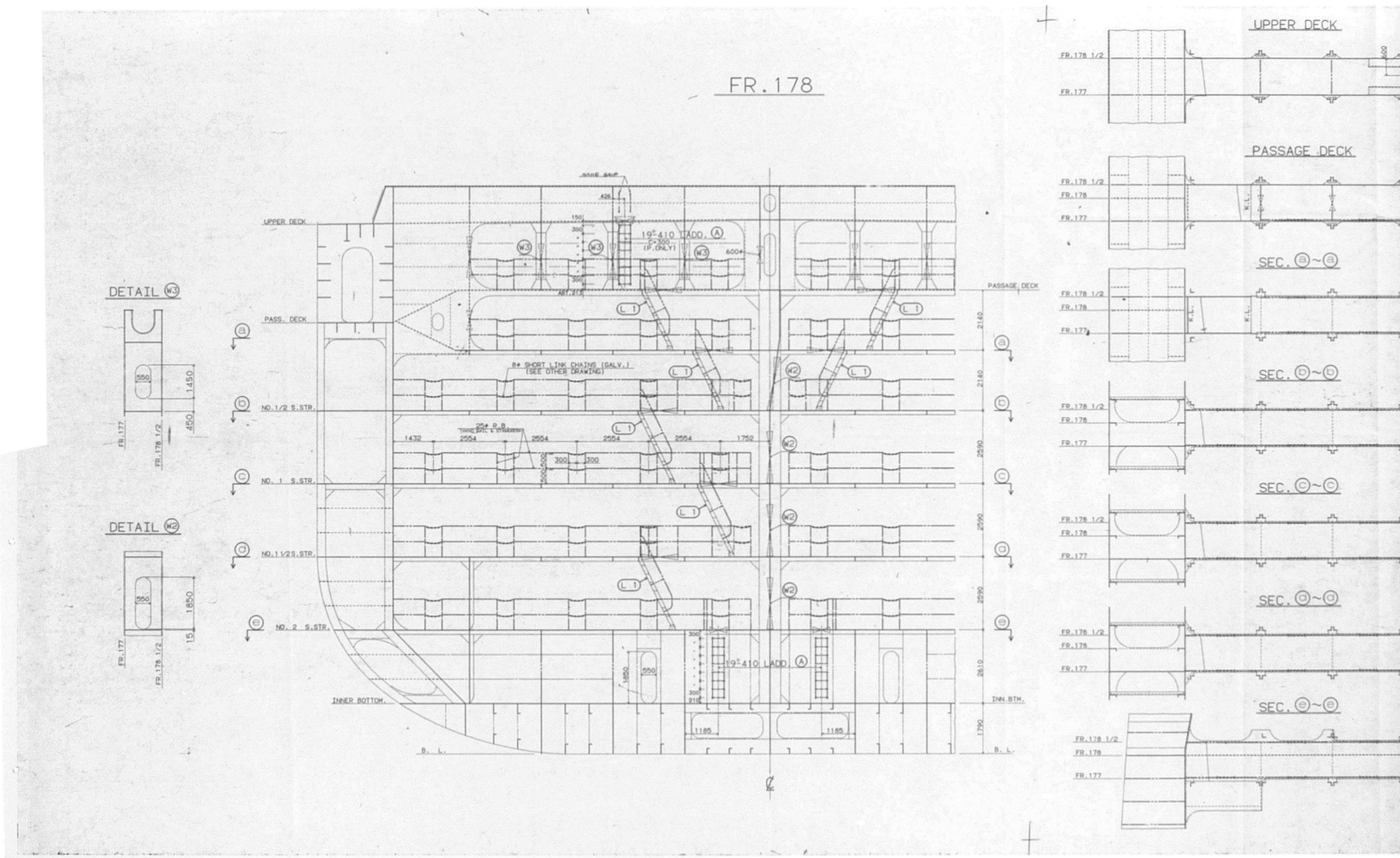


FR. 142
HAND GRIP FOR ACCESS IN HOLD
DETAIL W3
DETAIL W2
UPPER DECK
PASS. DECK
NO.1/2 S.STR.
NO. 1 S.STR.
NO.1 1/2S.STR.
NO. 2 S.STR.
INNER BOTTOM
B. L.
PASSAGE DECK
INN.BTM.
19-410 LADD. A
(P.ONLY)
8ϕ SHORT LINK CHAINS (GALV.)
(SEE OTHER DRAWING)
25ϕ R.B.
UPPER DECK
PASSAGE DECK
SEC. ⓑ~ⓑ
SEC. ⓒ~ⓒ
SEC. ⓓ~ⓓ
SEC. ⓔ~ⓔ
SEC. ⓔ~ⓔ
FR.142 1/2
FR.142
FR.141



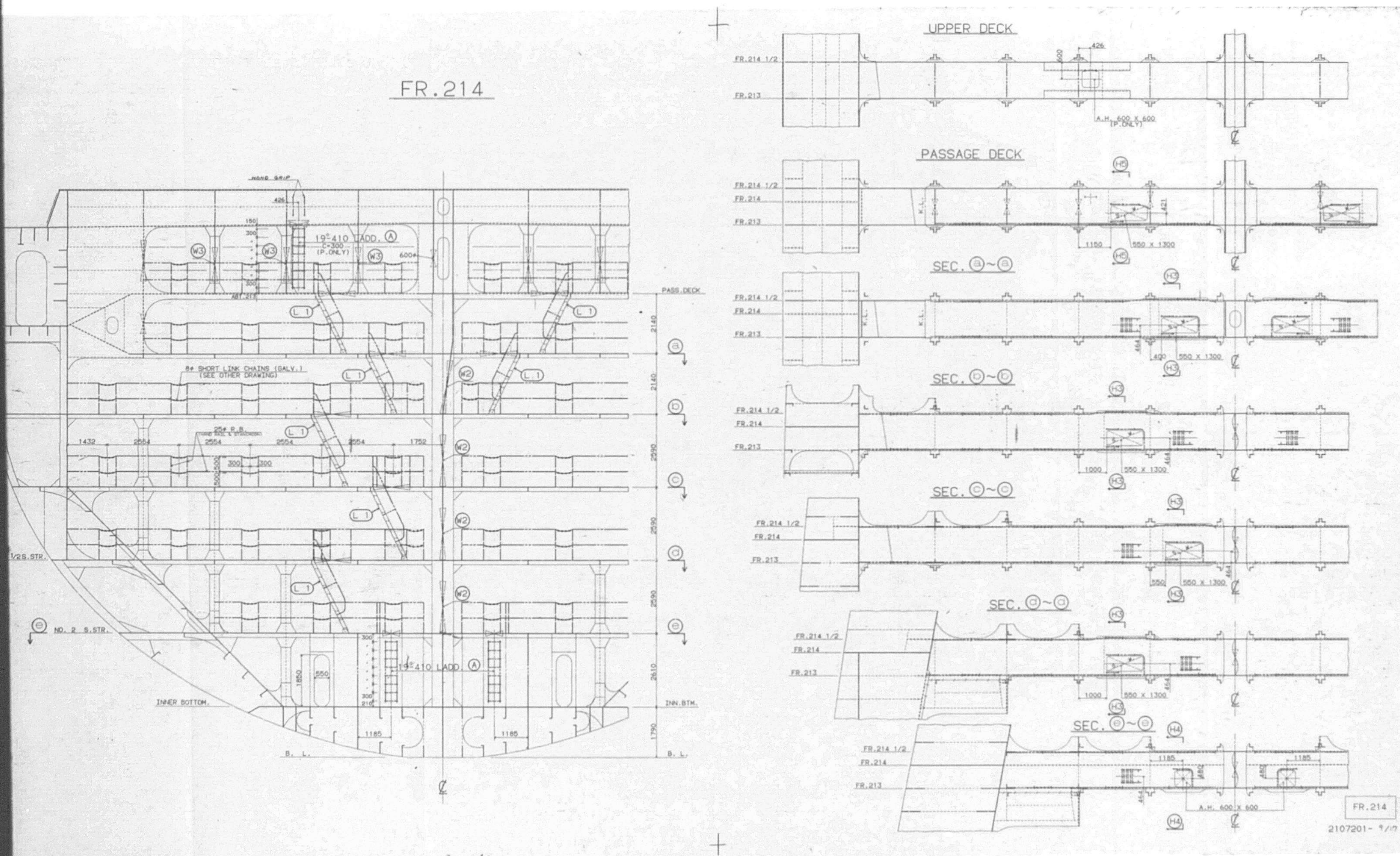
FR.178
UPPER DECK
PASSAGE DECK
SEC. ⓐ~ⓐ
SEC. ⓑ~ⓑ
SEC. ⓒ~ⓒ
SEC. ⓓ~ⓓ
SEC. ⓔ~ⓔ
19$^{\phi}$-410 LADD. Ⓐ
8ϕ SHORT LINK CHAINS (GALV.)
(SEE OTHER DRAWING)
PASSAGE DECK
INN.BTM.
B. L.
A.H. 600 X 600
(P.ONLY)
550 X 1300
FR.178 1/2
FR.178
FR.177
2107201-

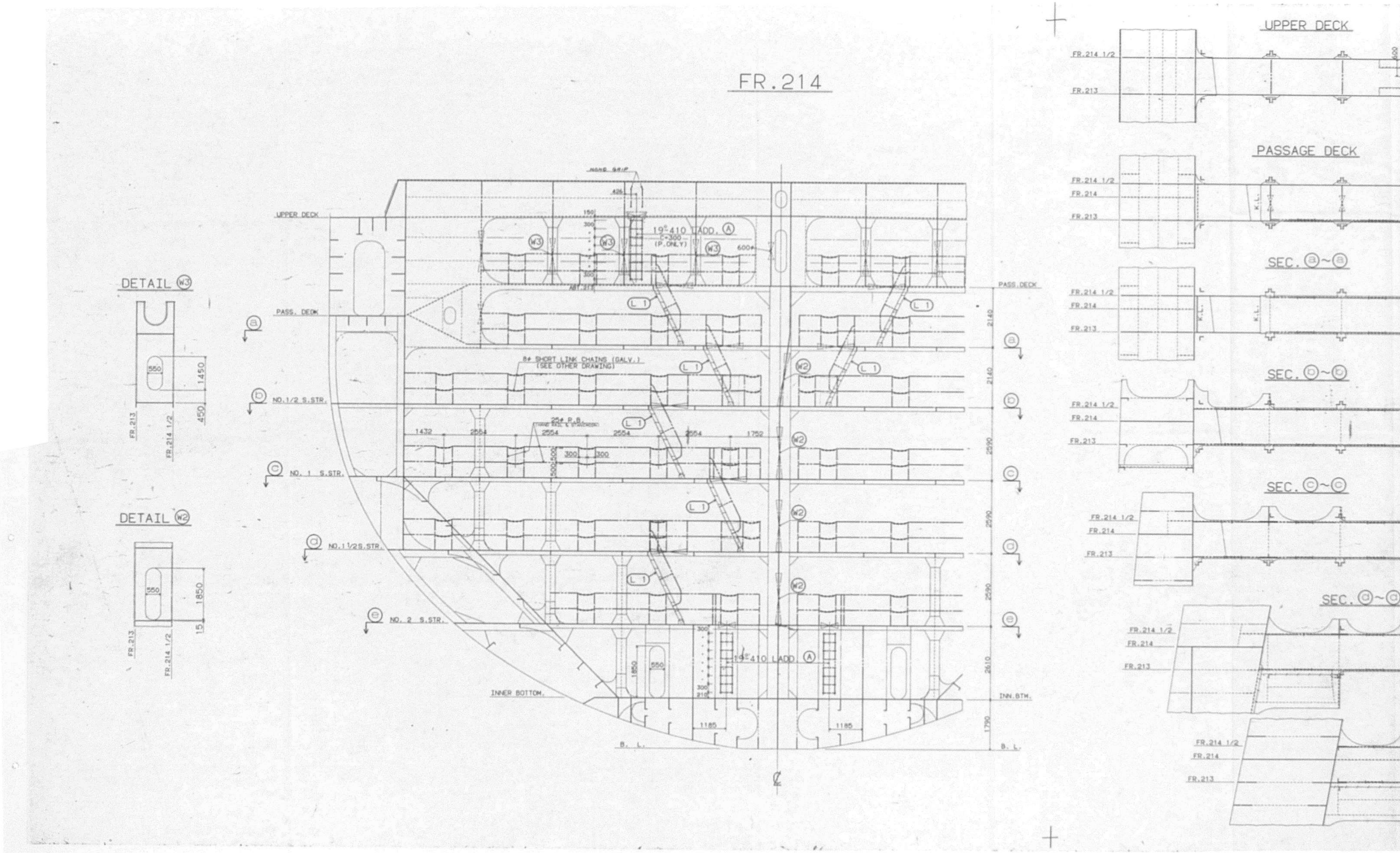
841



FR.178
DETAIL W3
DETAIL W2
UPPER DECK
PASS. DECK
NO.1/2 S.STR.
NO. 1 S.STR.
NO.1 1/2S.STR.
NO. 2 S.STR.
INNER BOTTOM
19-410 LADD. A
8φ SHORT LINK CHAINS (GALV.) (SEE OTHER DRAWING)
PASSAGE DECK
INN.BTM.
UPPER DECK
PASSAGE DECK
SEC. a~a
SEC. b~b
SEC. c~c
SEC. d~d
SEC. e~e

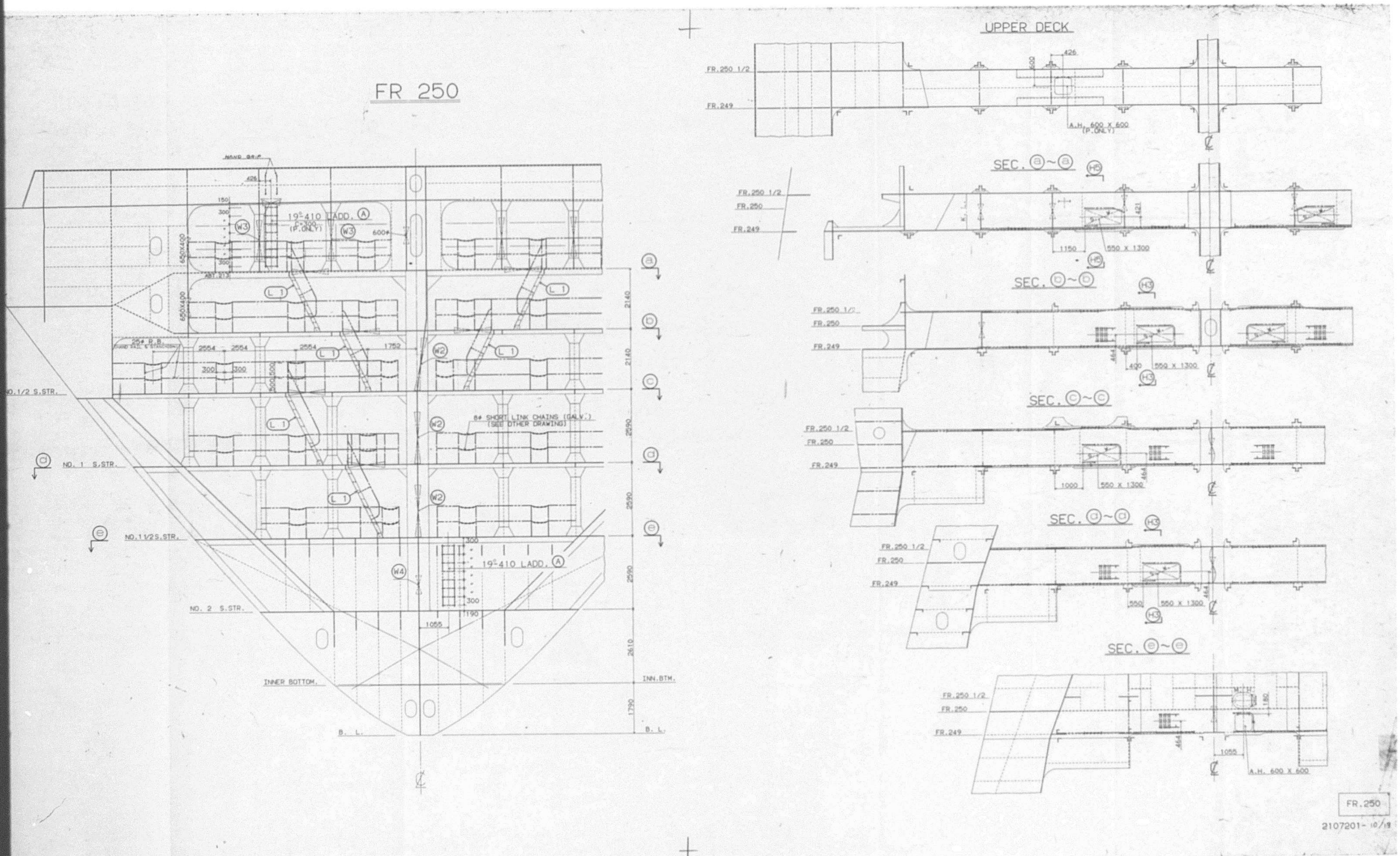
842


FR.214
UPPER DECK
PASSAGE DECK
SEC. ⓐ~ⓐ
SEC. ⓑ~ⓑ
SEC. ⓒ~ⓒ
SEC. ⓓ~ⓓ
SEC. ⓔ~ⓔ
PASS.DECK
INNER BOTTOM.
INN.BTM.
NO. 2 S.STR.
B. L.
A.H. 600 X 600
550 X 1300
FR.214 1/2
FR.214
FR.213
FR.214
2107201-



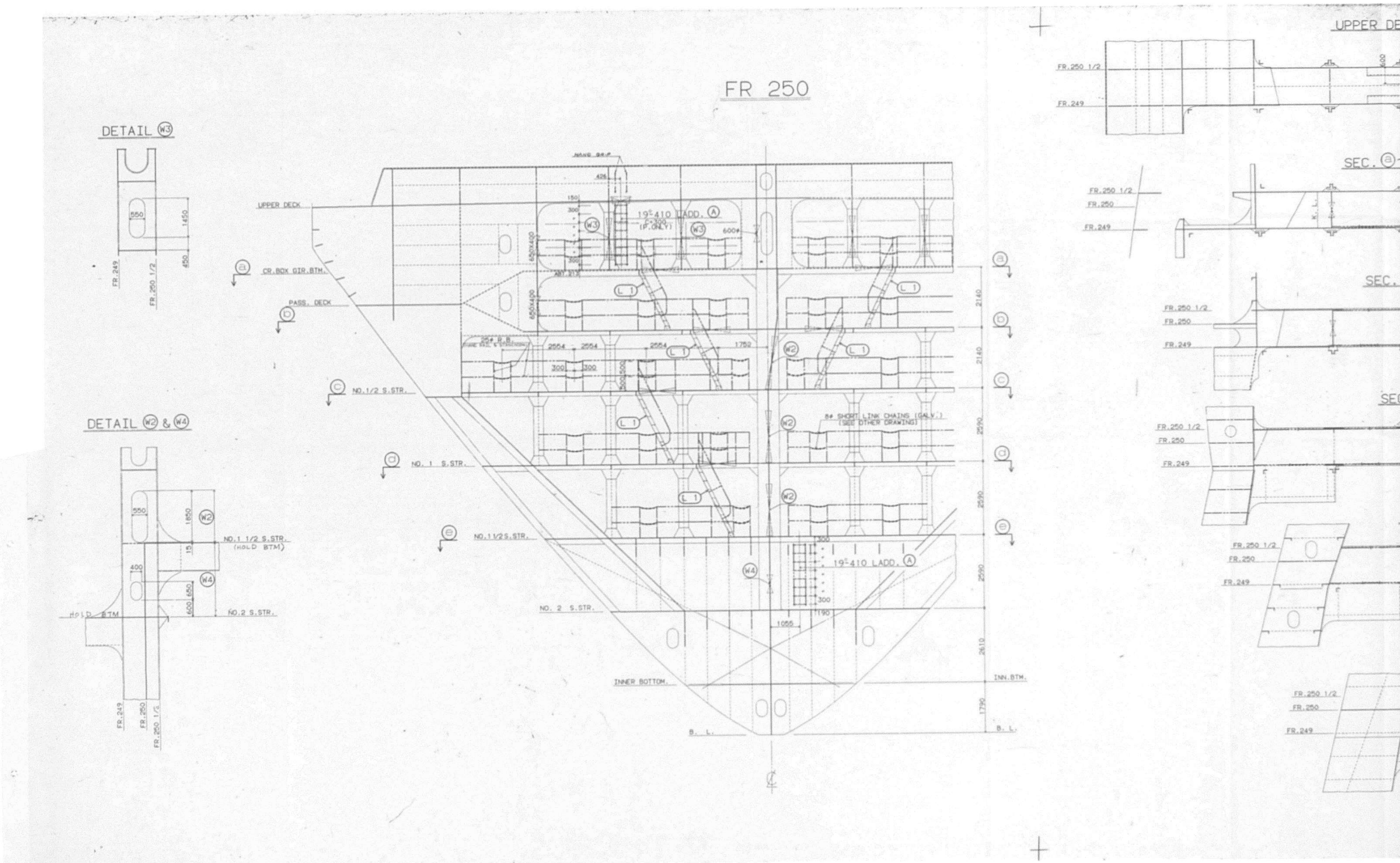
FR.214
DETAIL W3
DETAIL W2
UPPER DECK
PASS. DECK
NO.1/2 S.STR.
NO. 1 S.STR.
NO.1 1/2S.STR.
NO. 2 S.STR.
INNER BOTTOM
INN.BTM.
B. L.
19 410 LADD.
8ø SHORT LINK CHAINS (GALV.)
(SEE OTHER DRAWING)
UPPER DECK
PASSAGE DECK
SEC. a~a
SEC. b~b
SEC. c~c
SEC. d~d
FR.214 1/2
FR.214
FR.213

844



FR 250
UPPER DECK
SEC. ⓐ~ⓐ
SEC. ⓑ~ⓑ
SEC. ⓒ~ⓒ
SEC. ⓓ~ⓓ
SEC. ⓔ~ⓔ
19-410 LADD.
NO.1/2 S.STR.
NO. 1 S.STR.
NO.1 1/2 S.STR.
NO. 2 S.STR.
INNER BOTTOM.
INN.BTM.
B. L.
FR.250 1/2
FR.250
FR.249
A.H. 600 X 600
550 X 1300
FR.250
2107201-

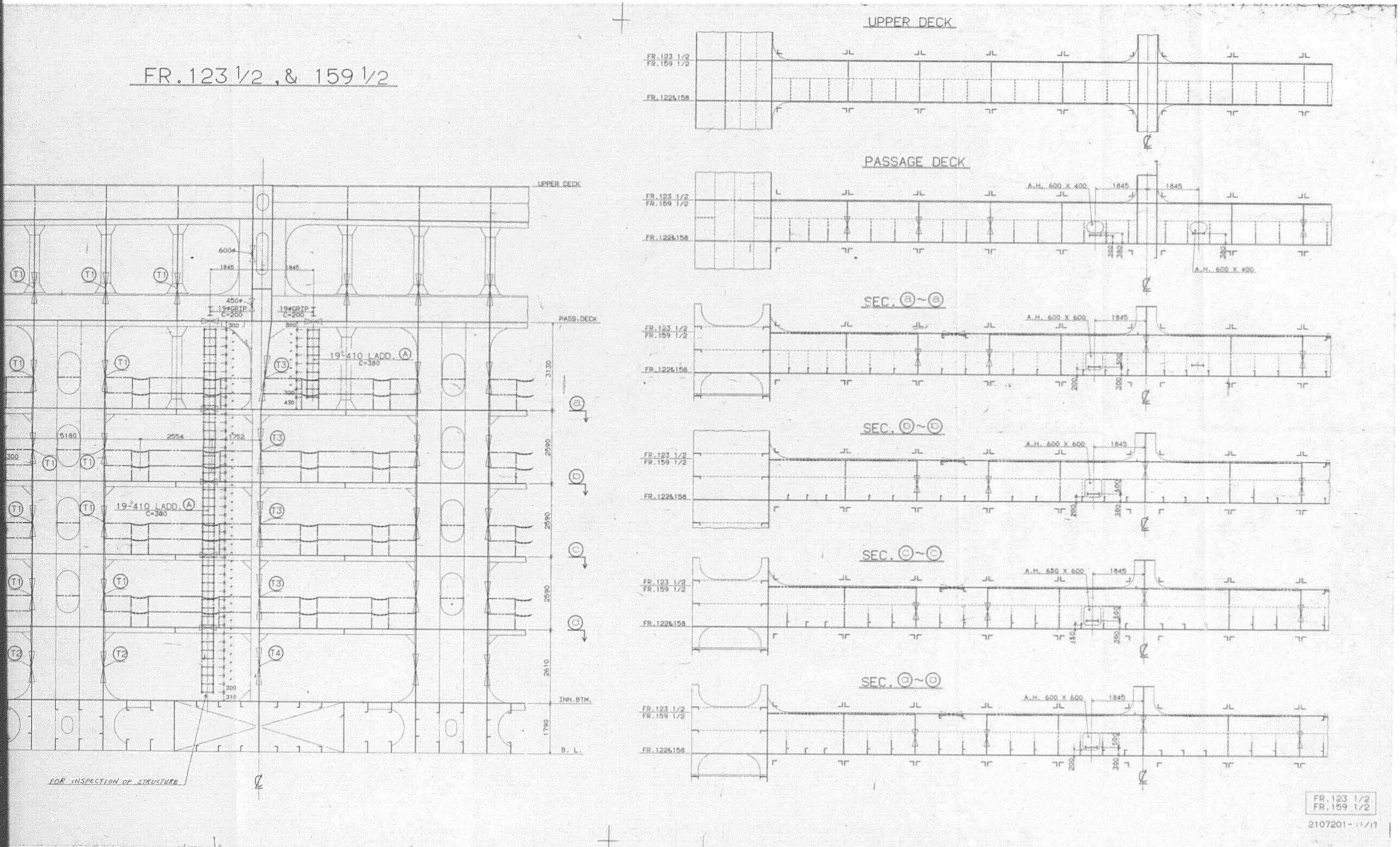
845

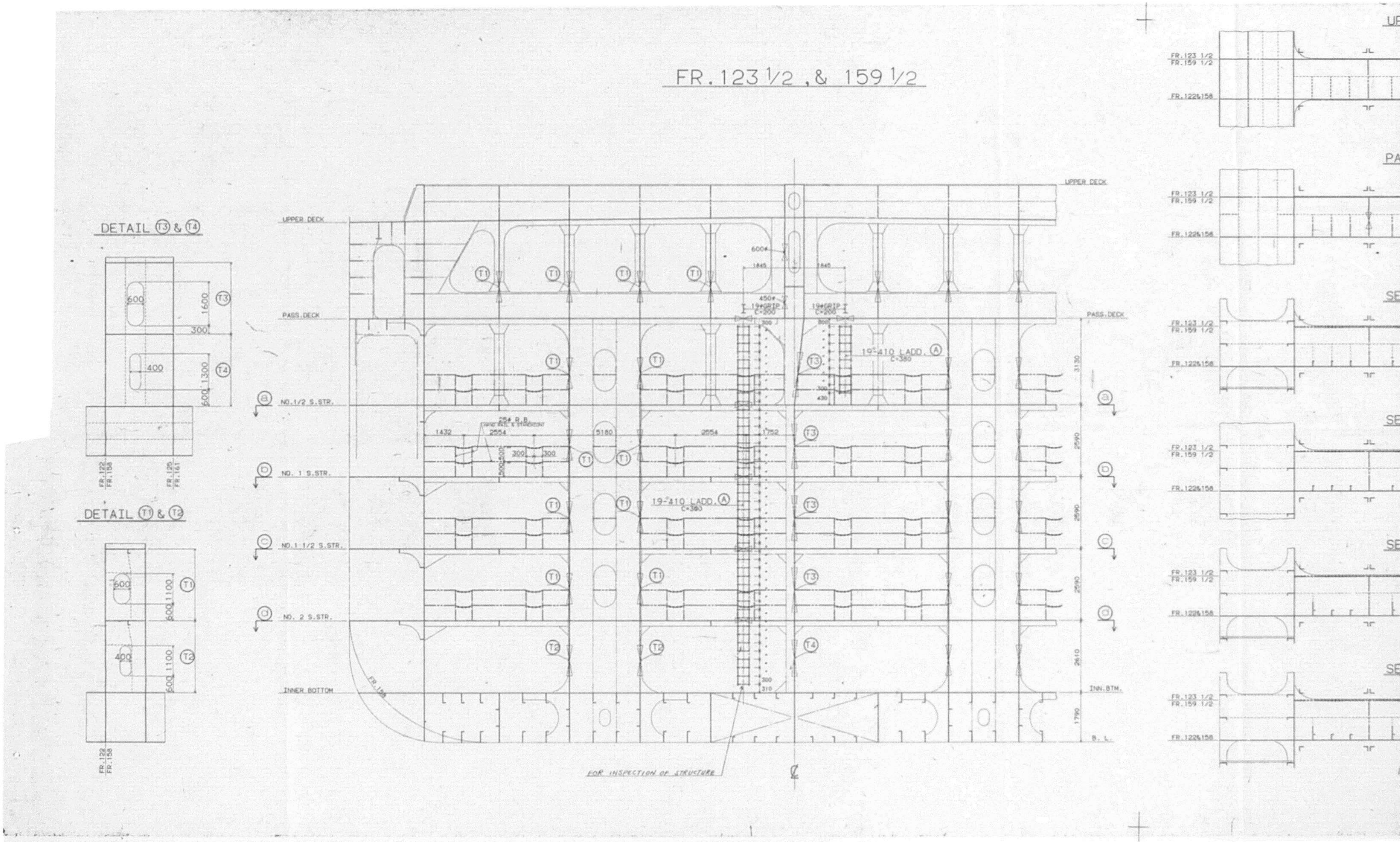


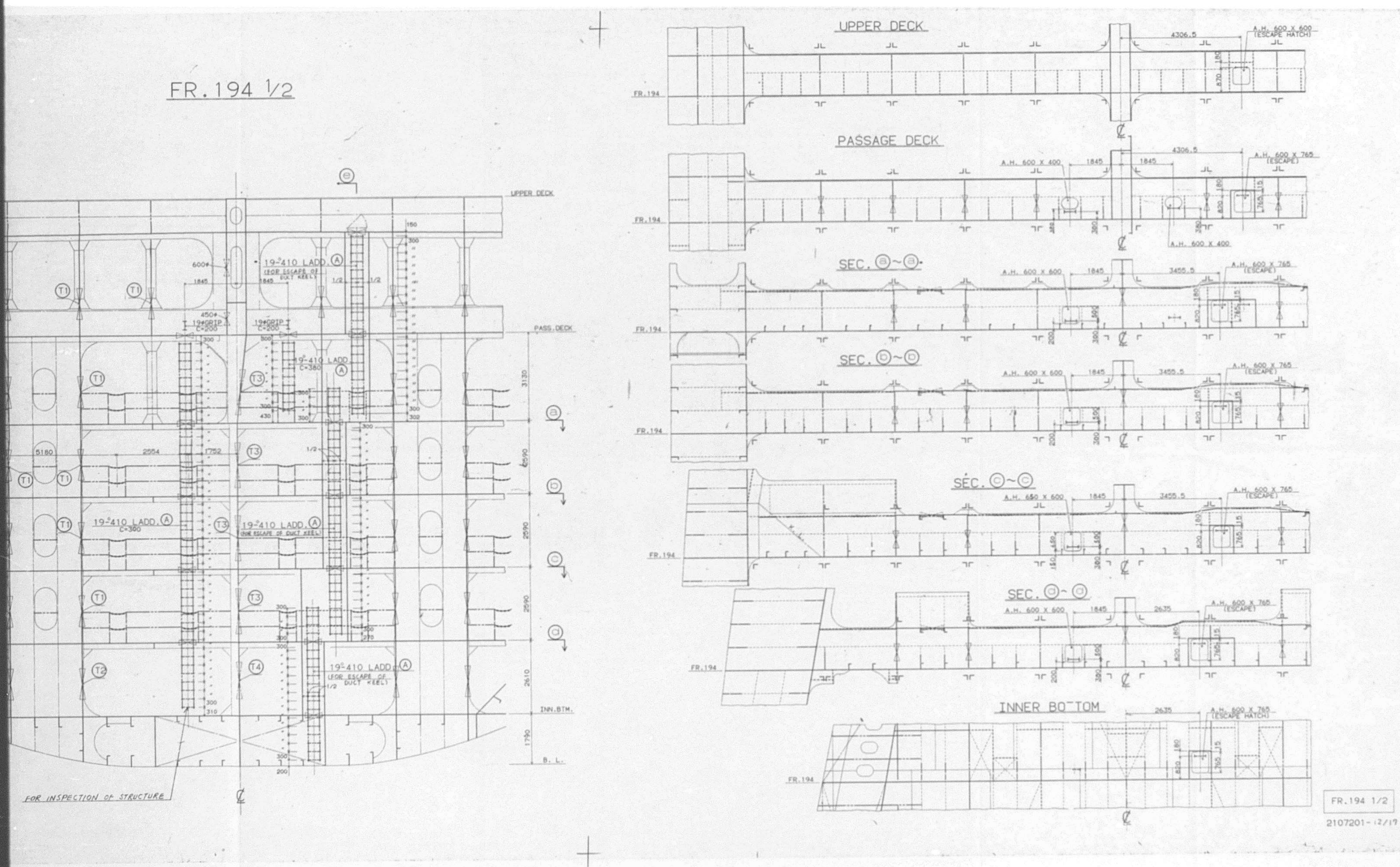
FR 250
DETAIL W3
DETAIL W2 & W4
UPPER DECK
CR.BOX GIR.BTM.
PASS. DECK
NO.1/2 S.STR.
NO. 1 S.STR.
NO.1 1/2 S.STR.
NO. 2 S.STR.
INNER BOTTOM
INN.BTM.
B. L.
HOLD BTM
19-410 LADD.
SEC.
UPPER DEC

846

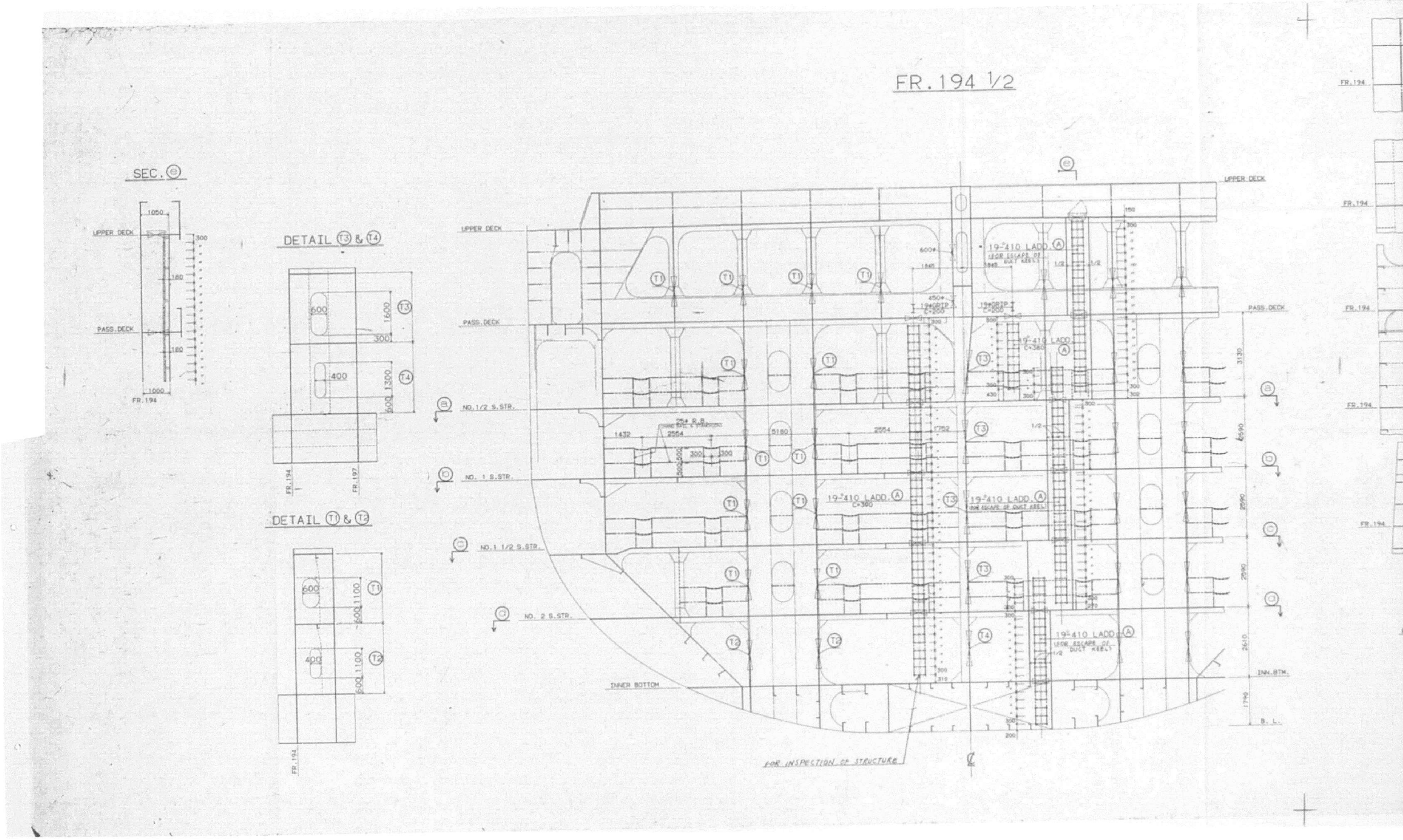
FR. 123 1/2 , & 159 1/2




FR.123 1/2 ,& 159 1/2
DETAIL T3 & T4
DETAIL T1 & T2
UPPER DECK
PASS. DECK
NO.1/2 S.STR.
NO. 1 S.STR.
NO.1 1/2 S.STR.
NO. 2 S.STR.
INNER BOTTOM
INN. BTM.
B.L.
19-410 LADD.
FOR INSPECTION OF STRUCTURE


FR.194 1/2
UPPER DECK
PASSAGE DECK
SEC. ⓐ~ⓐ
SEC. ⓑ~ⓑ
SEC. ⓒ~ⓒ
SEC. ⓓ~ⓓ
INNER BOTTOM
PASS.DECK
INN.BTM.
B.L.
19-410 LADD. Ⓐ
FOR INSPECTION OF STRUCTURE
FR.194 1/2
2107201-12/17

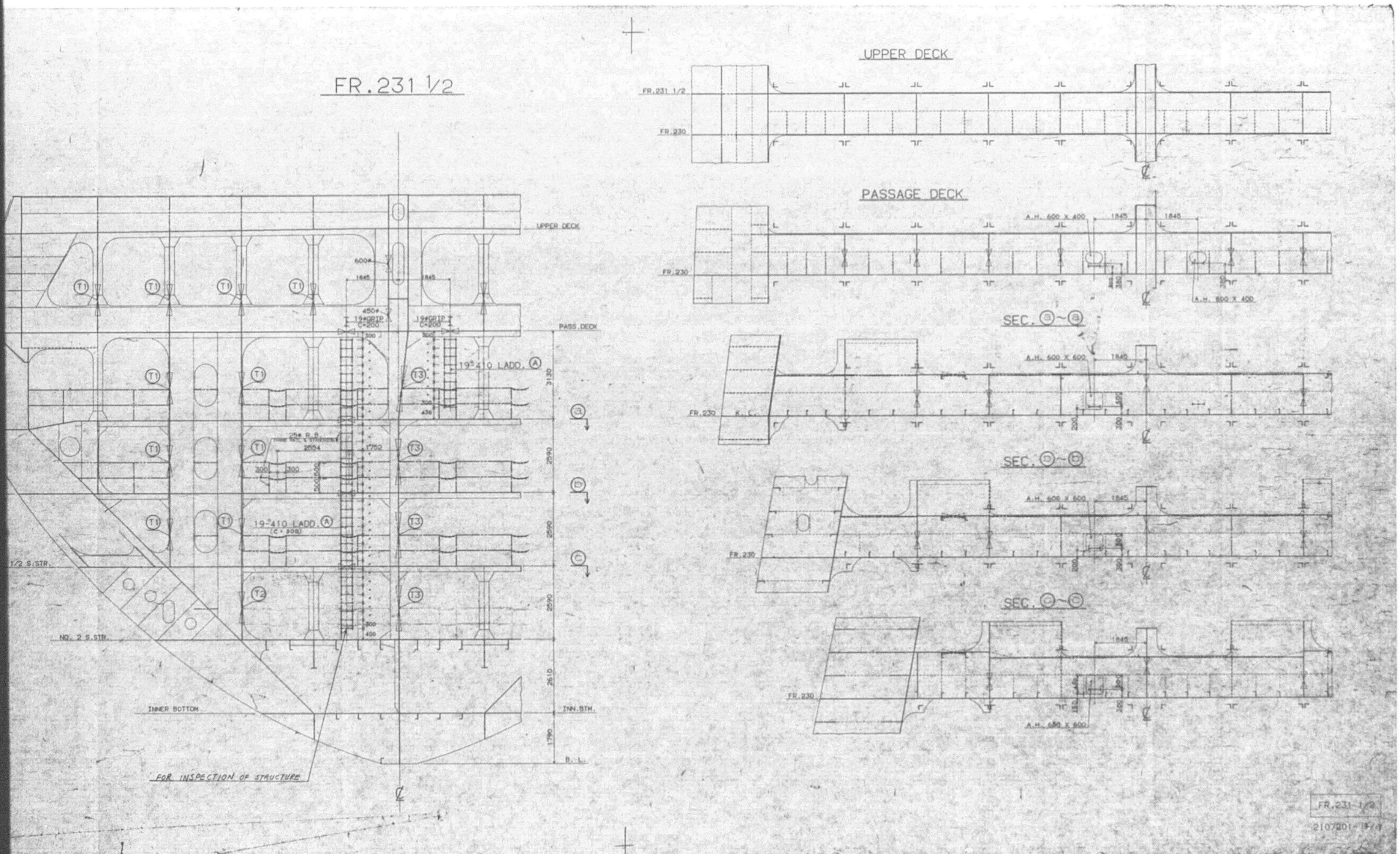
849



FR. 194 1/2
SEC. ⓔ
UPPER DECK
PASS. DECK
FR. 194
DETAIL Ⓣ3 & Ⓣ4
DETAIL Ⓣ1 & Ⓣ2
FR. 197
NO. 1/2 S.STR.
NO. 1 S.STR.
NO. 1 1/2 S.STR.
NO. 2 S.STR.
INNER BOTTOM
19-410 LADD. Ⓐ
FOR ESCAPE OF DUCT KEEL
FOR INSPECTION OF STRUCTURE
INN. BTM.
B. L.

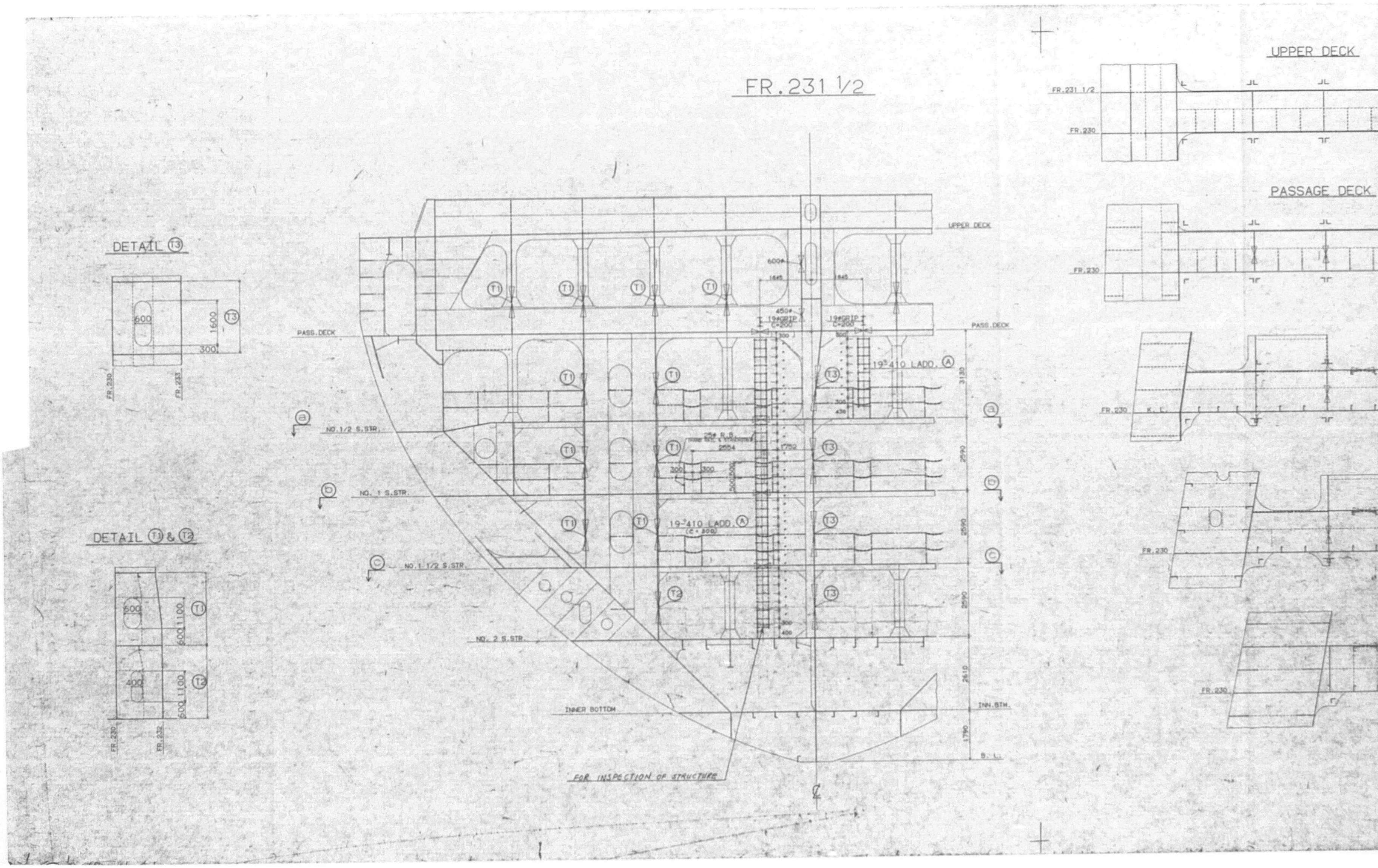
2/2

850



FR.231 1/2
UPPER DECK
PASSAGE DECK
SEC. ⓐ~ⓐ
SEC. ⓑ~ⓑ
SEC. ⓒ~ⓒ
PASS.DECK
INNER BOTTOM
INN.BTM.
B.L.
NO. 2 S.STR.
19²410 LADD. Ⓐ
FOR INSPECTION OF STRUCTURE
FR.231 1/2
FR.230
A.H. 600 X 400
A.H. 600 X 600

851

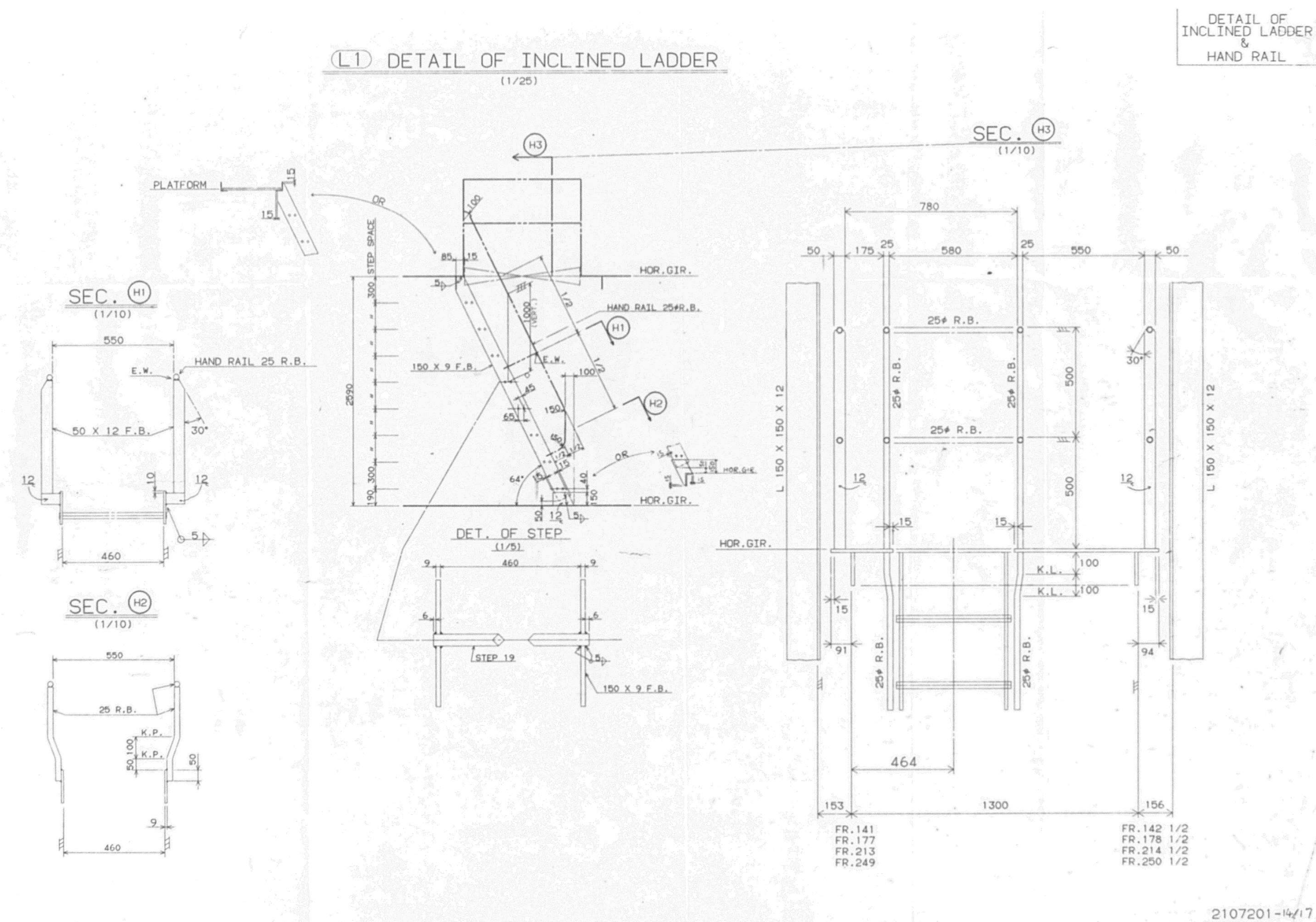

FR.231 1/2
UPPER DECK
PASSAGE DECK
DETAIL T3
DETAIL T1 & T2
UPPER DECK
PASS.DECK
NO.1/2 S.STR.
NO. 1 S.STR.
NO.1 1/2 S.STR.
NO. 2 S.STR.
INNER BOTTOM
INN.BTM.
B.L.
19-410 LADD. A
FOR INSPECTION OF STRUCTURE
FR.230
FR.231 1/2

2/2

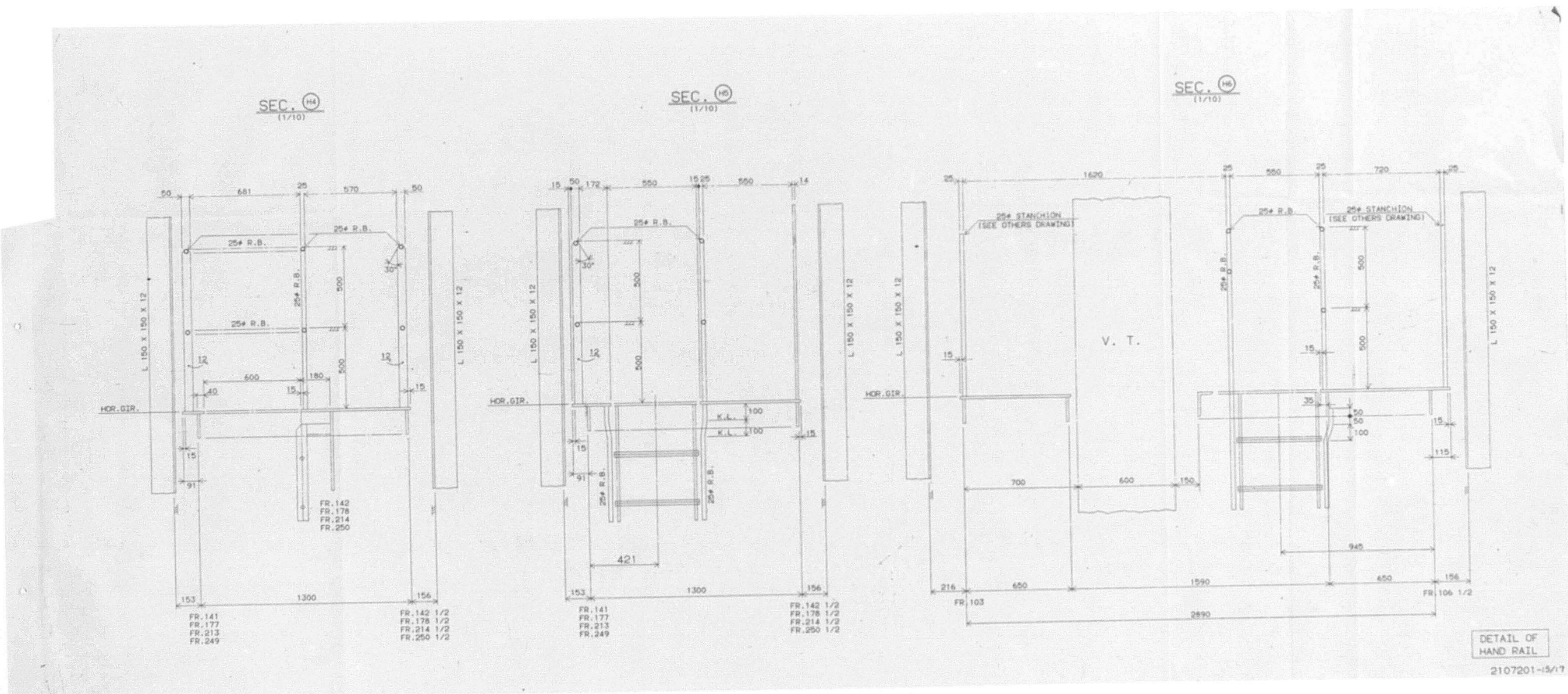
852

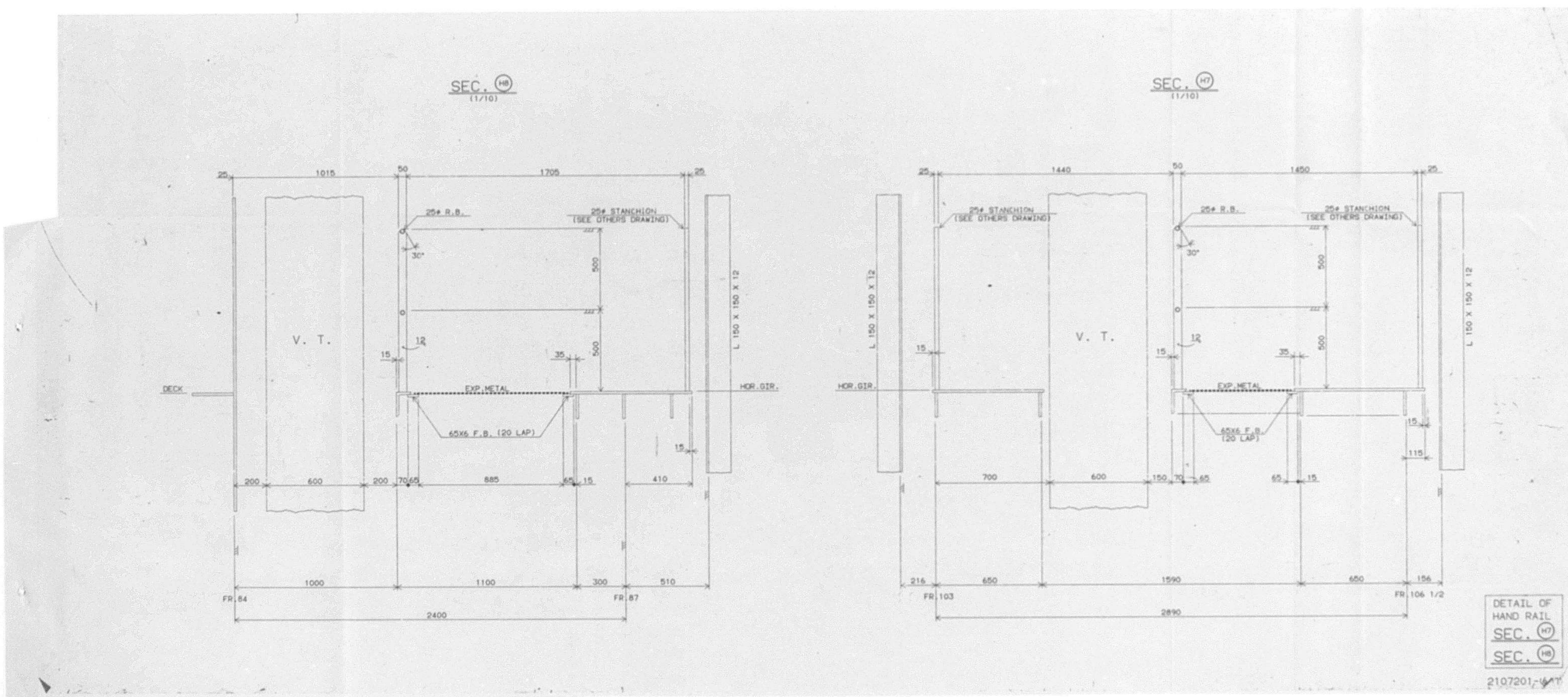
(L1) DETAIL OF INCLINED LADDER

(1/25)



853


SEC. H4
(1/10)
SEC. H5
(1/10)
SEC. H6
(1/10)
25φ R.B.
L 150 X 150 X 12
HOR.GIR.
K.L.
25φ STANCHION
(SEE OTHERS DRAWING)
V. T.
FR.141
FR.177
FR.213
FR.249
FR.142 1/2
FR.178 1/2
FR.214 1/2
FR.250 1/2
FR.142
FR.178
FR.214
FR.250
FR.103
FR.106 1/2
DETAIL OF
HAND RAIL
2107201-15/17



SEC. H8
(1/10)
SEC. H7
(1/10)
V. T.
25φ R.B.
25φ STANCHION
(SEE OTHERS DRAWING)
EXP. METAL
65X6 F.B. (20 LAP)
DECK
HOR. GIR.
L 150 X 150 X 12
FR.84
FR.87
FR.103
FR.106 1/2
DETAIL OF
HAND RAIL
SEC. H7
SEC. H8
2107201-

855

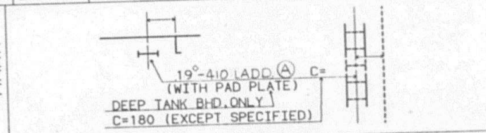
船舶設計標準

垂直梯子 Ⓐ VERTICAL LADDER

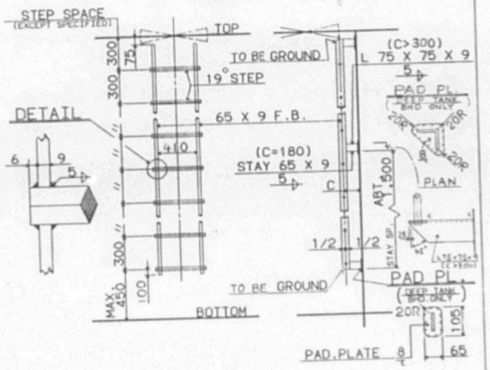
MES SD 30211

制定	9自57.11.5.
作成部所	玉船設一設

MARK



DETAIL



NOTES:-

1) MATERIAL --- SS41 OR CLASSED (19° & 65 X 9 F.B.)

MATERIAL --- CLASSED (PAD PLATE)

関連規格	制定者	課長	作成者	担当
	石崎	越川	石津	田中

2107201- 17/17

856

PLAN RECORD BY MHI

ALT. NO.	MARK	DESCRIPTION	DATE	BY
ORIG.		FOLLOWED MES ORIGINAL PLAN.	MAY 17, '85	
01		DO. PARTLY REVISED PLAN NO. 1	JUL. 17, '85	
02		DO. NO. 2	SEP. 5, '85	
03		DO. NO. 3	FEB. 13, '86	
04		DO. NO. 4	MAR. 17, '86	
05		DO. NO. 6	SEP. 16, '86	
06	A	REARRANGED HAND RAIL & ADDED CLOSED PL. AT CORNER OF STAIR WAY IN PASSAGE DECK ON FR. 142, 178, 214 & 250 CONT. SUPPORT CONT.	NOV. 18, '86	
F		PREPARED AS FINISHED PLAN FOR S.NO.1158	MAR. 11, '87	

19 SHEETS WITH COVER

CON-FERRED	SHIP DESIGNING DEPARTMENT HULL DESIGNING SECTION	CLASS ABS
	APPROVED S. Hirayama	
	CHECKED I. Furuhashi	
	DRAWN	
	SCALE	
	ORDER 01-15800	DRAWING NO. HS-57400-F

倉内梯子

LADDERS IN HOLDS

LYKES REF. NO. 160401

MITSUBISHI HEAVY INDUSTRIES, LTD.
KOBE SHIPYARD & ENGINE WORKS

APPROVAL OF OWNER & REGULATORY BODIES

ALT. NO.	OWNER DATE	OWNER LETTER NO.	USCG DATE	USCG LETTER NO.	ABS DATE	ABS LETTER NO.	USPH DATE	USPH LETTER NO.
ORIGINAL	18 JUN '85	OF T5/MES-505						

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SHIPYARD AND SHIP'S NO. & NAME

MITSUI TAMANO		MITSUBISHI KOBE	
NO. 1323	~~DOCTOR LYKES~~	NO. 1158	JAMES LYKES
NO. 1324	~~ALMERIA LYKES~~	NO. 1159	~~JOSEPH LYKES~~
NO. 1325	~~TILLIE LYKES~~	NO. 1164	~~SOLON TURMAN~~

MITSUI ENGINEERING & SHIPBUILDING CO., LTD.
TAMANO WORKS

SHIP DESIGN DEPARTMENT MANAGER — STRUCTURE DESIGN SEC. — SEC. CHIEF N. Yamamoto — ASSIST CHIEF — CHARGE ENG'R — STAFF M. Ozawa — DATE 60. 2. 10.

PARTLY REVISED PLAN NO. 1

倉内梯子

LADDERS IN HOLDS

JOB NO. TS1323/24/25 — SCALE 1/100 — LYKES REF. NO. 160401 — MITSUI DRAWING NO. 2107201-1

(SHEETS WITH COVER)

PLAN RECORD

ALT. NO.	MARK	ALTERATION/DESCRIPTION	DATE & SIGNATURE
ORIGINAL		PREPARED FOR APPROVAL OWNER & WWF	APR. 11, '85
1	1	OWNERS COMMENT	JUL. 9 '85
	1	MISCELLANEOUS REVISION (DESIGN DEVELOPMENT)	
2	2	MISCELLANEOUS REVISION (DESIGN DEVELOPMENT)	AUG.
	2	REVISED ACCORDING TO WWF REQ. DATED 13TH JUNE '85 LTR NO. 551/1835 MK:NA	
3	3	REVISED ACCORDING TO THE REQUEST OF OWNER IN TAMANO TO KEEP THE ACCESSIBILITY	FEB. 6. '86 Y. H.
4	4	MISCELLANEOUS REVISION	MAR. 5 '86 Y. H.
5	5	MISCELLANEOUS REVISION	MAR. 11 '86
6	6	VERT. LADD IS PROVIDED FOR THE ACCESS WHICH IS REQUIRED BY OWNER'S SUPERINTENDENT IN TAMANO	SEP. 8 '86 T.H.

DWG. NO. 2107201 1/

NOTES:-

1. BOTH SIDES TO BE SYMMETRICAL EXCEPT SPECIFIED.
2. TRANS. SECTIONS TO BE "LOOKING FORE" EXCEPT SPECIFIED.
3. FILLET WELDING TO BE 5+ EXCEPT SPECIFIED.
4. MATERIAL -----SS41 OR CLASSED STEEL.

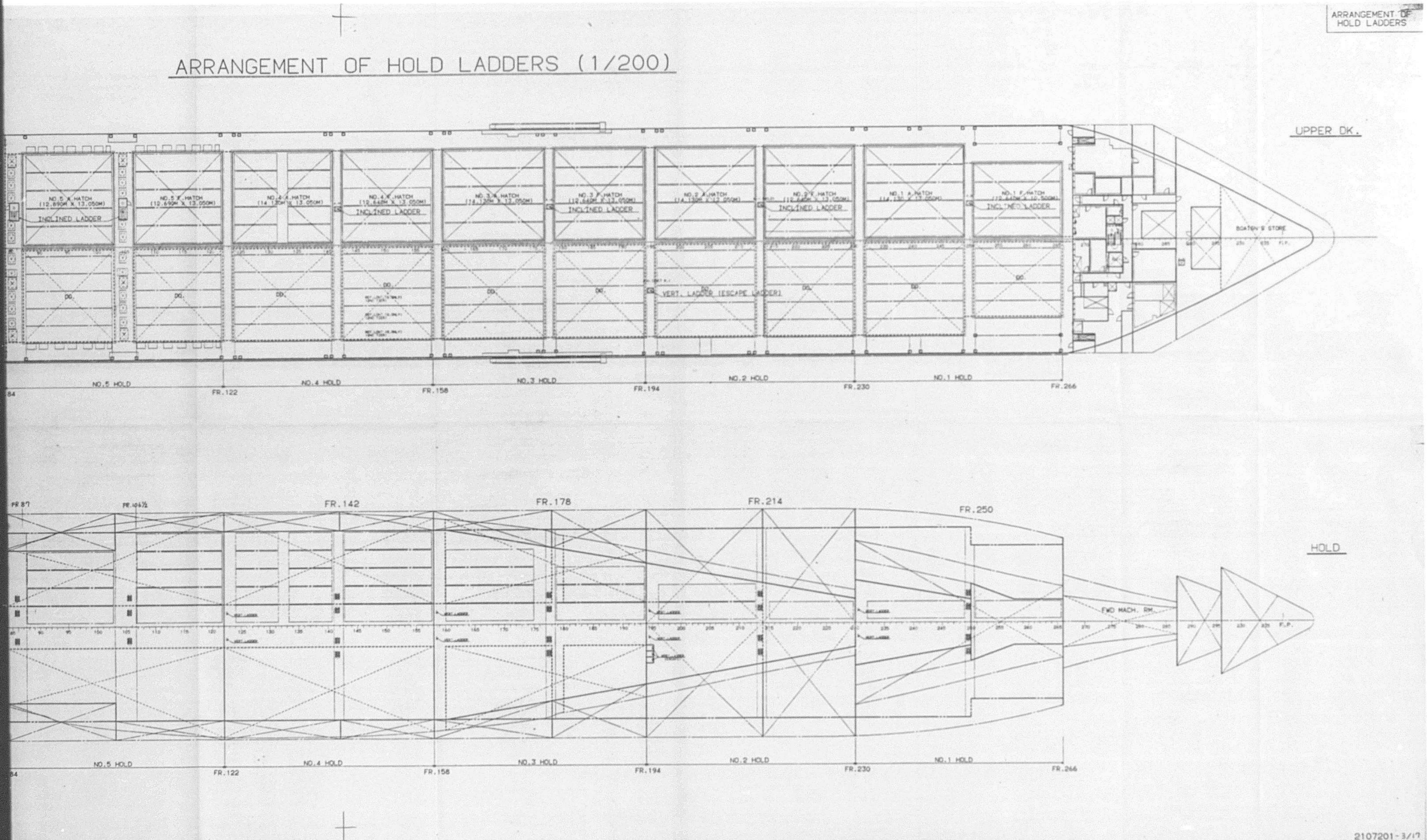
備考:-

1. 特記の他は，両舷対称とする。
2. 横断面図は，特記の他は後面を示す。
3. すみ肉溶接は，特記の他は 5+ とする。
4. 材料 -----SS41 OR CLASSED STEEL.

2107201-2/17

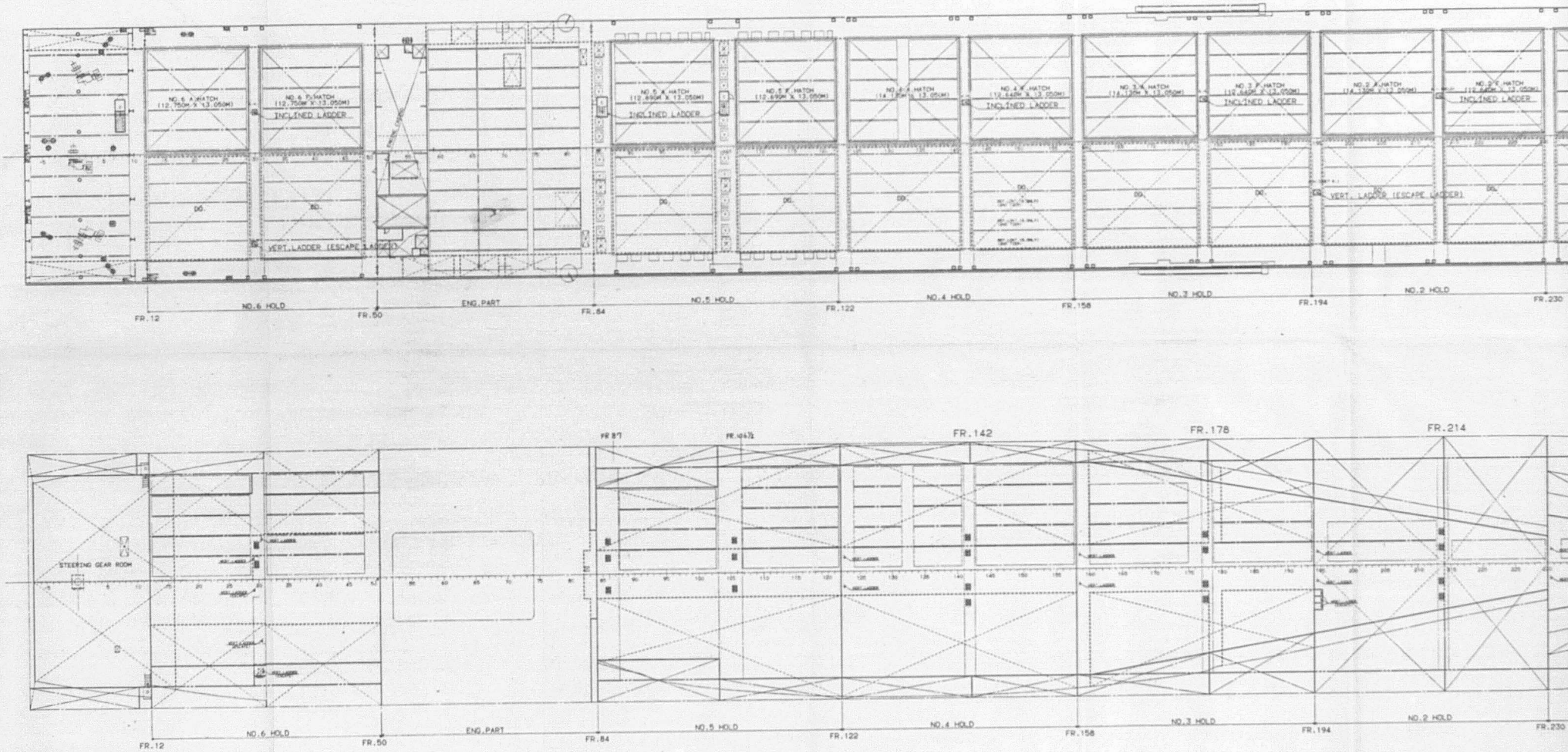
857

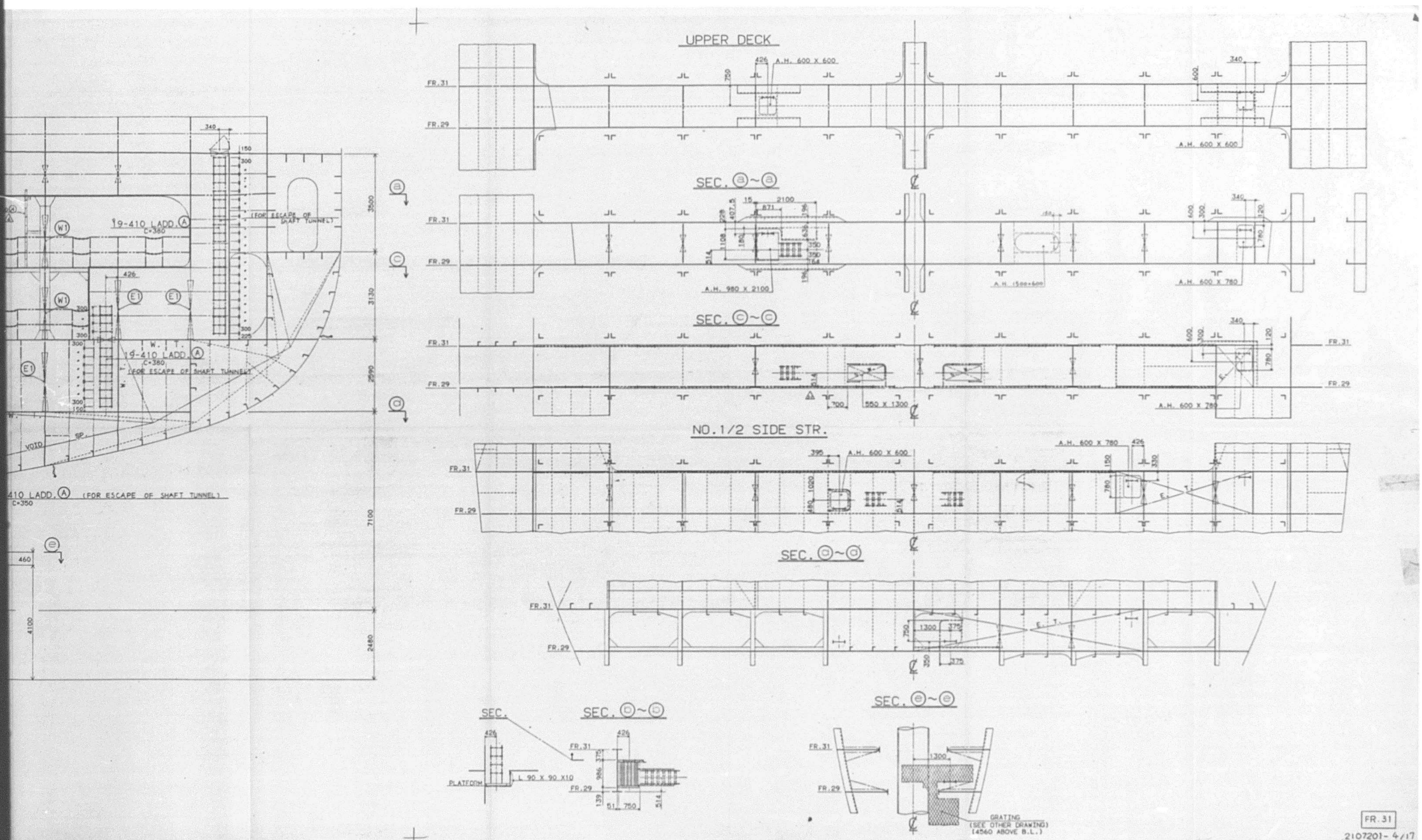
ARRANGEMENT OF HOLD LADDERS (1/200)

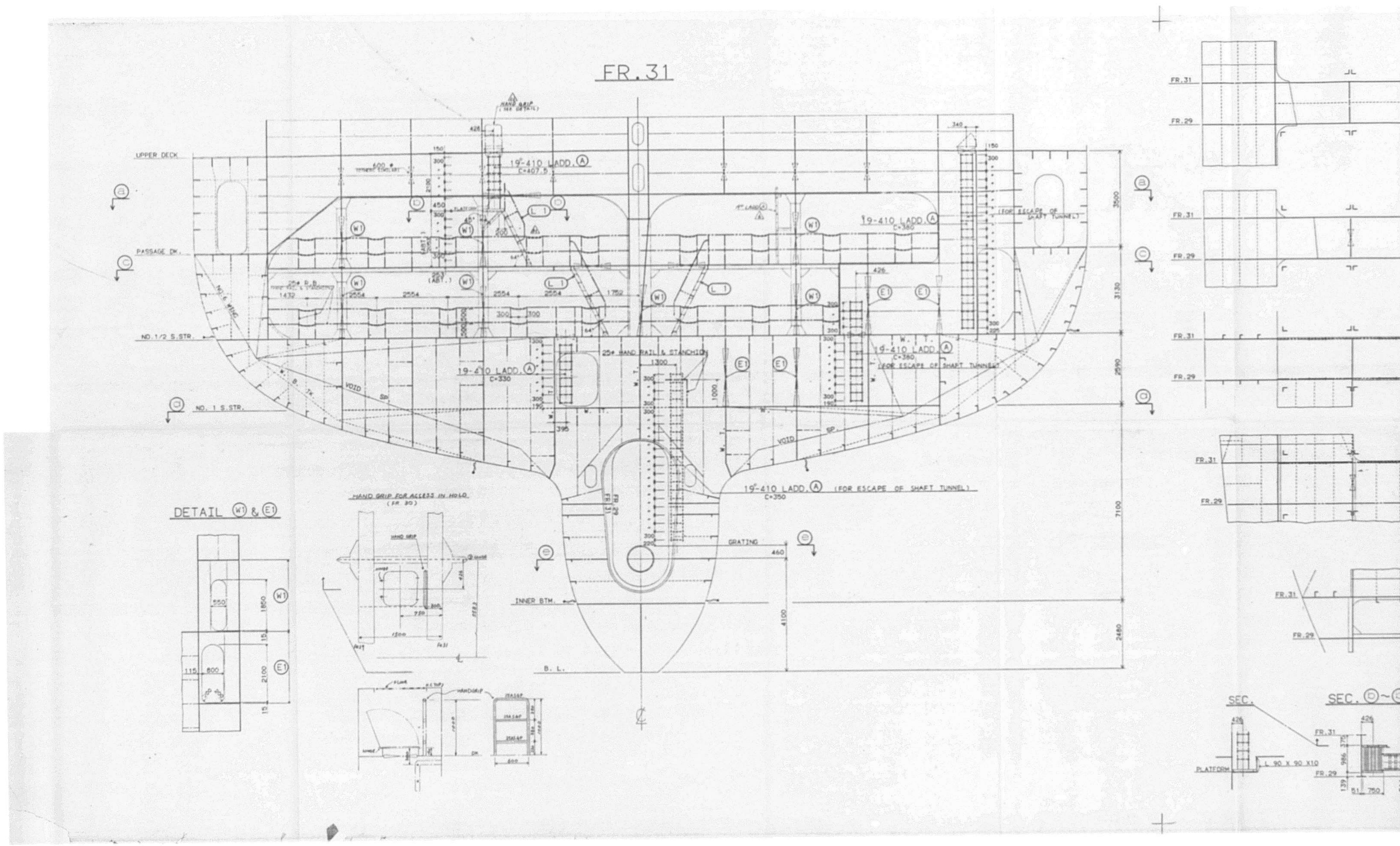


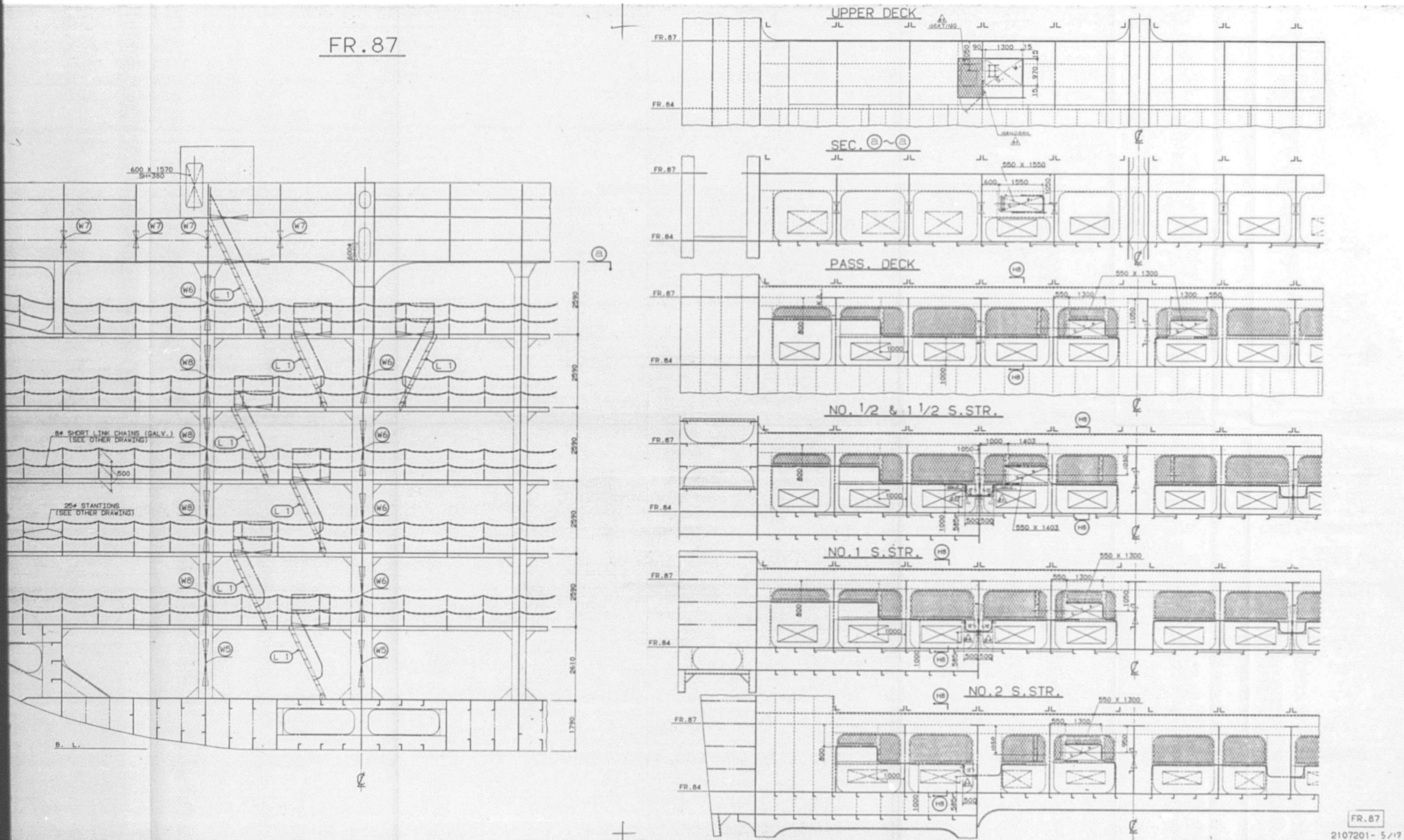
858

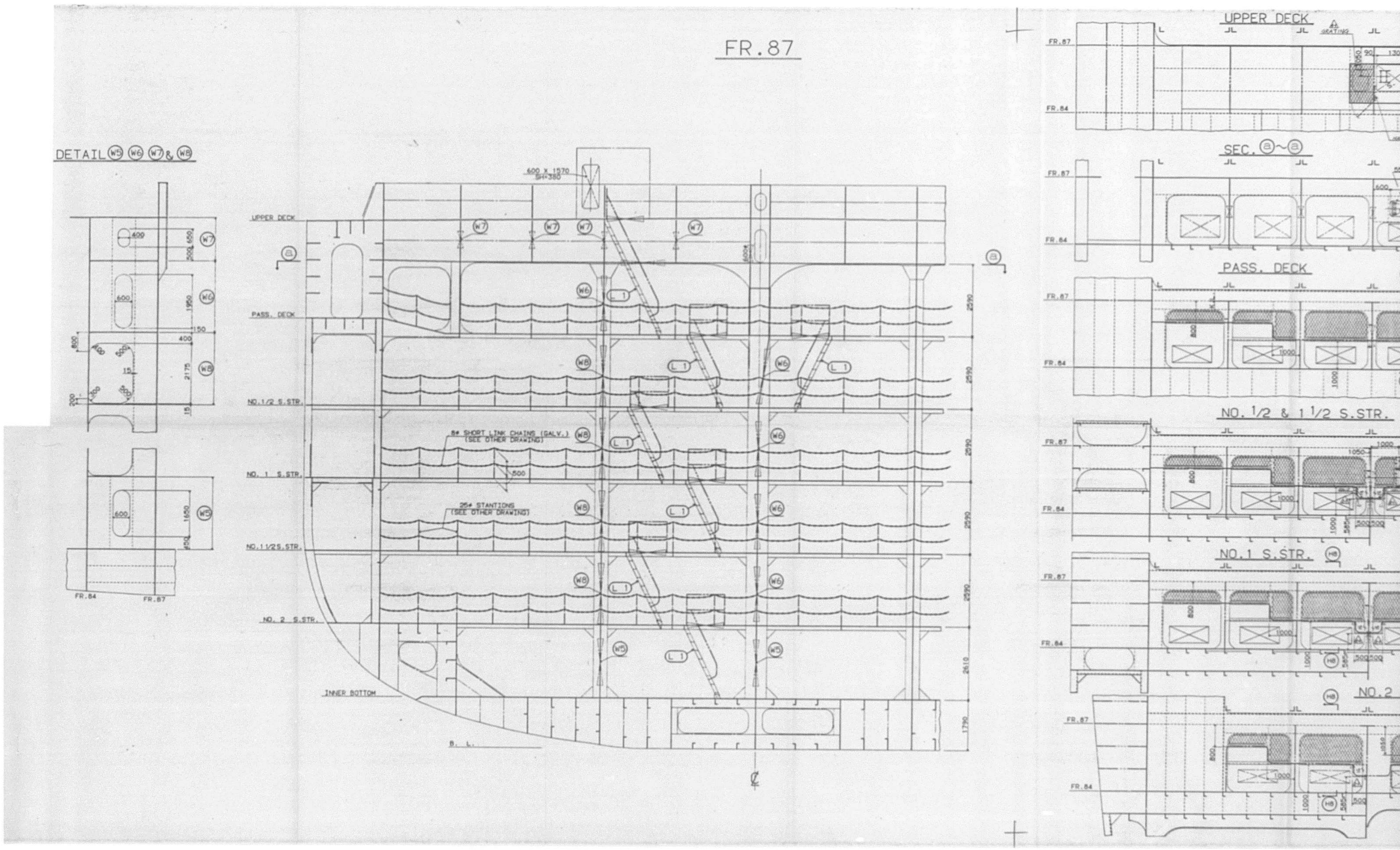
ARRANGEMENT OF HOLD LADDERS (1/200)




UPPER DECK
SEC. ⓐ~ⓐ
SEC. ⓒ~ⓒ
NO.1/2 SIDE STR.
SEC. ⓓ~ⓓ
SEC. ⓔ~ⓔ
SEC.
SEC. ⓑ~ⓑ
A.H. 600 X 600
A.H. 980 X 2100
A.H. 600 X 780
550 X 1300
19-410 LADD. Ⓐ
(FOR ESCAPE OF SHAFT TUNNEL)
W.T.
VOID
PLATFORM
L 90 X 90 X10
GRATING
(SEE OTHER DRAWING)
(4560 ABOVE B.L.)
FR.31
FR.29
2107201- 4/17


FR. 31
UPPER DECK
PASSAGE DK.
NO. 1/2 S. STR.
NO. 1 S. STR.
19"-410 LADD. Ⓐ C=407.5
19"-410 LADD. Ⓐ C=380
(FOR ESCAPE OF SHAFT TUNNEL)
19"-410 LADD. Ⓐ C=330
19"-410 LADD. Ⓐ C=380 (FOR ESCAPE OF SHAFT TUNNEL)
19"-410 LADD. Ⓐ (FOR ESCAPE OF SHAFT TUNNEL) C=350
25φ HAND RAIL & STANCHION
VOID
GRATING
INNER BTM.
B. L.
DETAIL W1 & E1
HAND GRIP FOR ACCESS IN HOLD (FR. 30)
FR. 31
FR. 29
SEC.
PLATFORM
L 90 X 90 X10
SEC. Ⓓ~Ⓓ

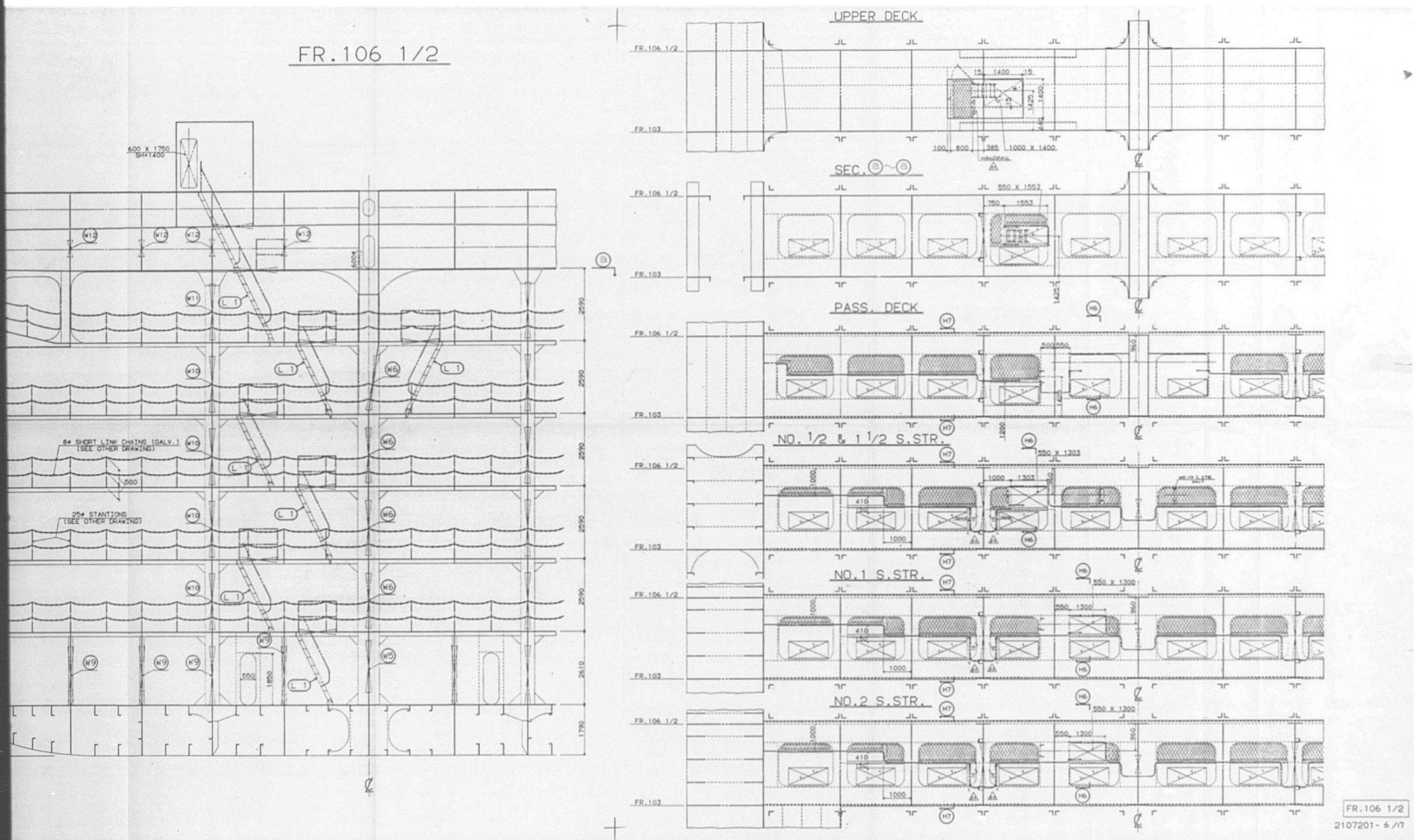

FR.87
600 X 1570
SH=380
8φ SHORT LINK CHAINS (GALV.)
(SEE OTHER DRAWING)
25φ STANTIONS
(SEE OTHER DRAWING)
B. L.
UPPER DECK
GRATING
HANDRAIL
SEC. Ⓐ~Ⓐ
PASS. DECK
NO. 1/2 & 1 1/2 S.STR.
NO.1 S.STR.
NO.2 S.STR.
550 X 1300
550 X 1550
550 X 1403
FR.87
FR.84
FR.87
2107201- 5/17

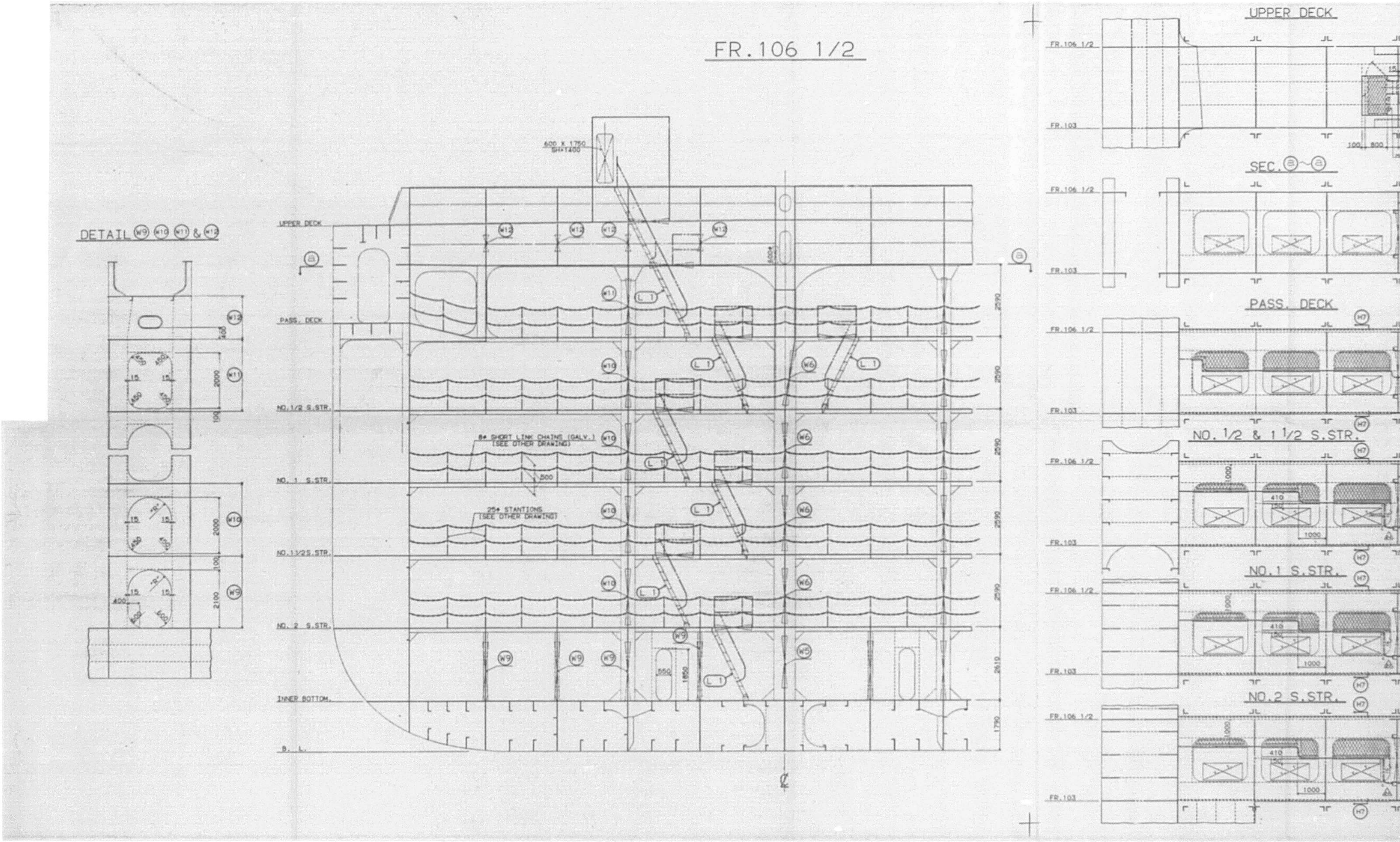


FR.87
DETAIL W5 W6 W7 & W8
UPPER DECK
PASS. DECK
NO.1/2 S.STR.
NO. 1 S.STR.
NO.1 1/2 S.STR.
NO. 2 S.STR.
INNER BOTTOM
B. L.
600 X 1570
8ø SHORT LINK CHAINS (GALV.)
(SEE OTHER DRAWING)
25ø STANTIONS
(SEE OTHER DRAWING)
FR.84
FR.87
UPPER DECK
SEC. ⓐ~ⓐ
PASS. DECK
NO. 1/2 & 1 1/2 S.STR.
NO.1 S.STR.
NO.2 S

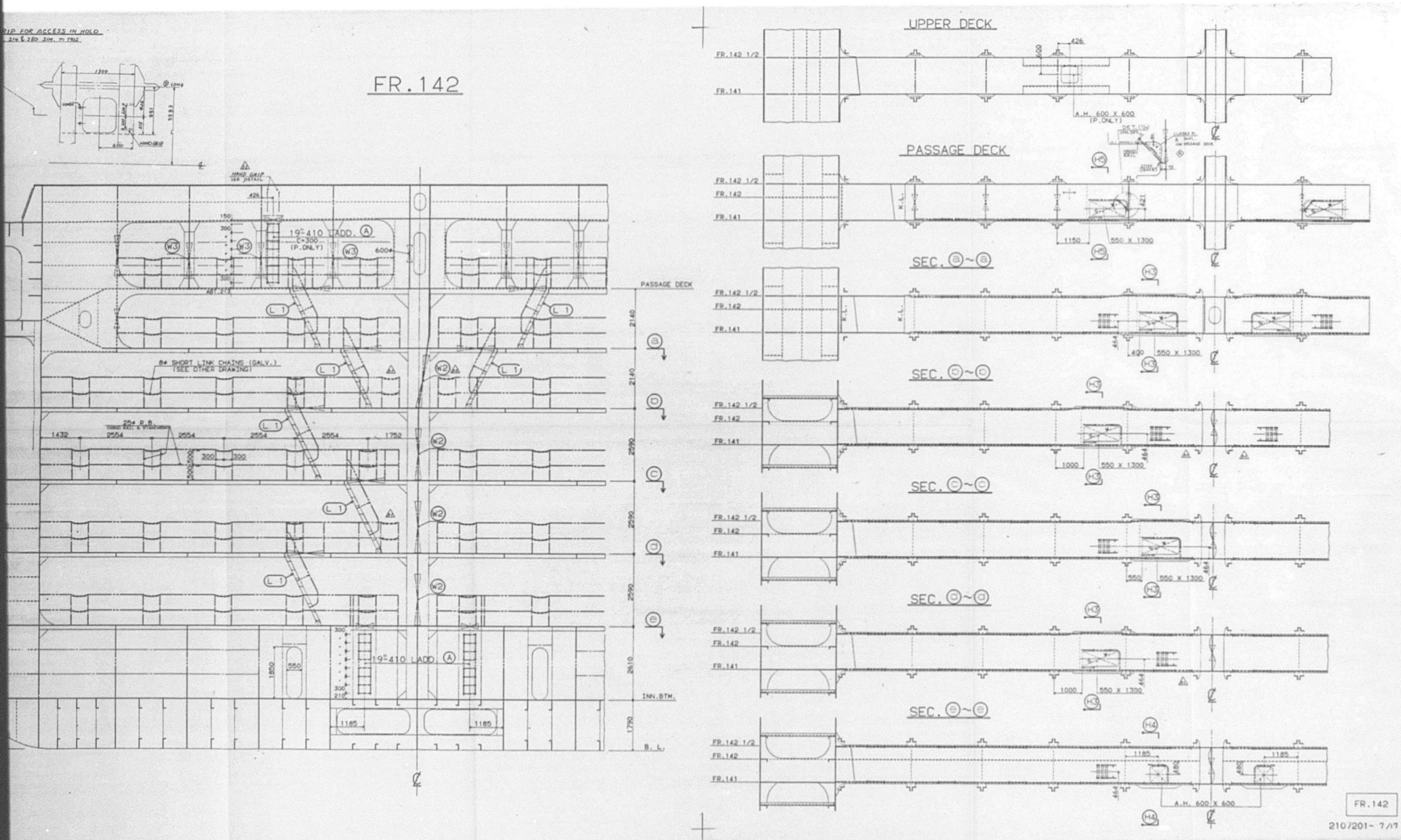
2/2

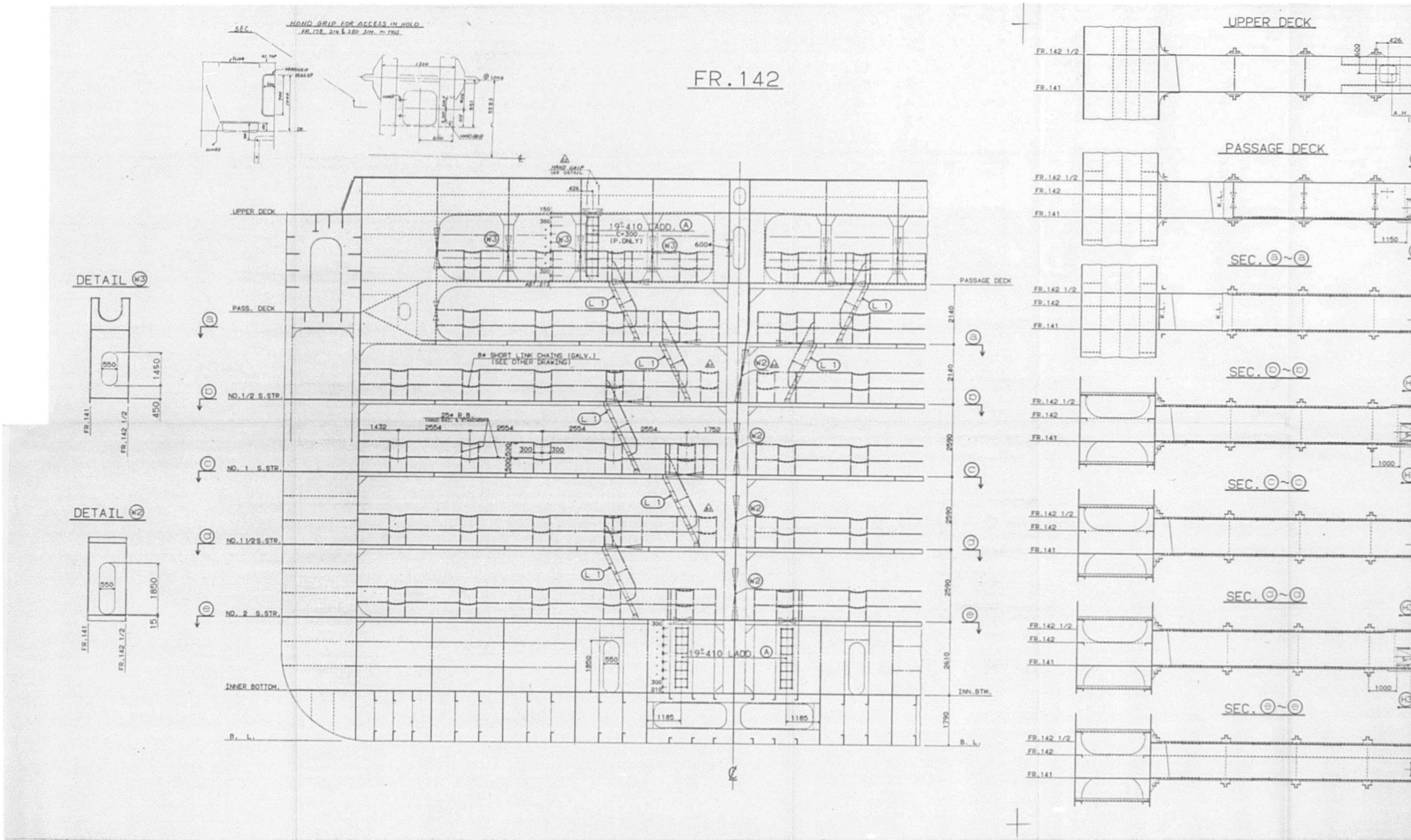
863


FR.106 1/2
UPPER DECK
SEC. B~B
PASS. DECK
NO. 1/2 & 1 1/2 S.STR.
NO.1 S.STR.
NO.2 S.STR.
600 X 1750
8ϕ SHORT LINK CHAINS (GALV.)
(SEE OTHER DRAWING)
25ϕ STANTIONS
(SEE OTHER DRAWING)
FR.106 1/2
2107201- 6 /17


FR.106 1/2
DETAIL W9 W10 W11 & W12
UPPER DECK
PASS. DECK
NO.1/2 S.STR.
NO. 1 S.STR.
NO.1 1/2 S.STR.
NO. 2 S.STR.
INNER BOTTOM
B. L.
600 X 1750
SH=1400
8φ SHORT LINK CHAINS (GALV.)
(SEE OTHER DRAWING)
25φ STANTIONS
(SEE OTHER DRAWING)
UPPER DECK
SEC. a~a
PASS. DECK
NO. 1/2 & 1 1/2 S.STR.
NO.1 S.STR.
NO.2 S.STR.
FR.106 1/2
FR.103

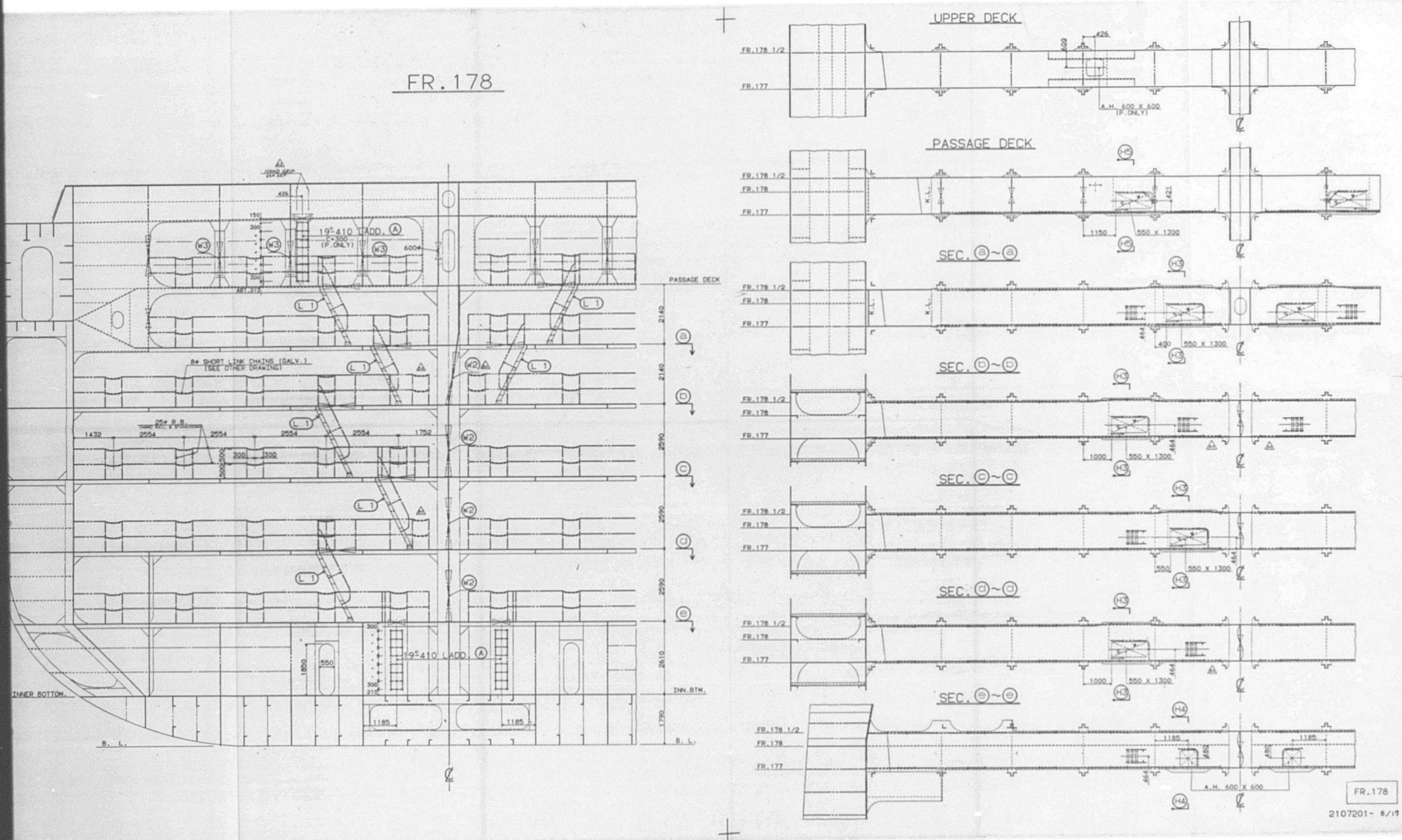
865

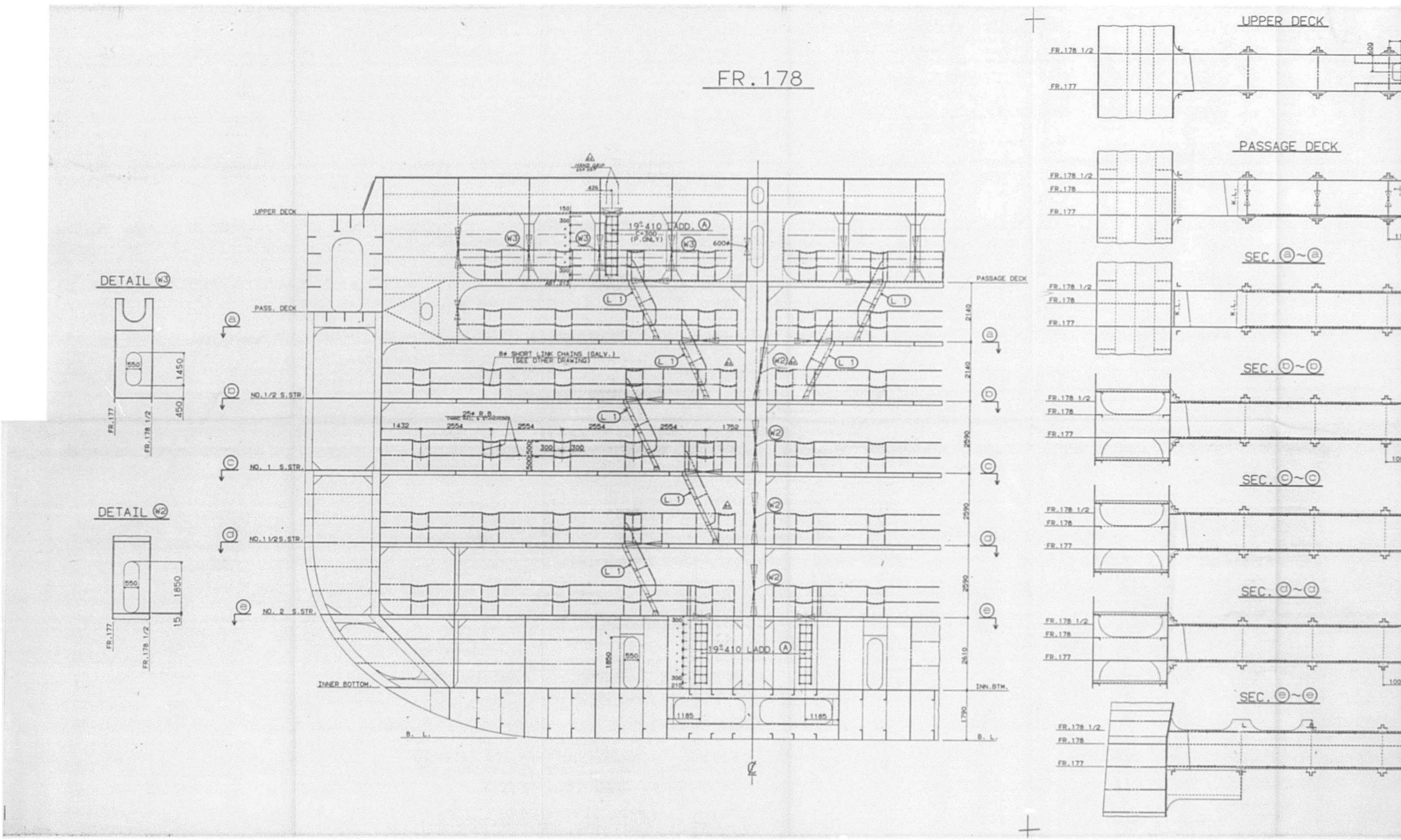

FR.142
UPPER DECK
PASSAGE DECK
SEC. ⓐ~ⓐ
SEC. ⓑ~ⓑ
SEC. ⓒ~ⓒ
SEC. ⓓ~ⓓ
SEC. ⓔ~ⓔ
PASSAGE DECK
INN.BTM.
B.L.
8φ SHORT LINK CHAINS (GALV.)
(SEE OTHER DRAWING)
19φ-410 LADD. Ⓐ
(P.ONLY)
A.H. 600 X 600
(P.ONLY)
550 X 1300
A.H. 600 X 600
FR.142
210/201- 7/17



FR.142
HAND GRIP FOR ACCESS IN HOLD
SEC.
DETAIL W3
DETAIL W2
UPPER DECK
PASS. DECK
NO.1/2 S.STR.
NO. 1 S.STR.
NO.1 1/2 S.STR.
NO. 2 S.STR.
INNER BOTTOM
B. L.
PASSAGE DECK
INN.BTM.
19"-410 LADD. A
19"-410 LADD. A
8φ SHORT LINK CHAINS (GALV.)
(SEE OTHER DRAWING)
UPPER DECK
PASSAGE DECK
SEC. a~a
SEC. b~b
SEC. c~c
SEC. d~d
SEC. e~e

867

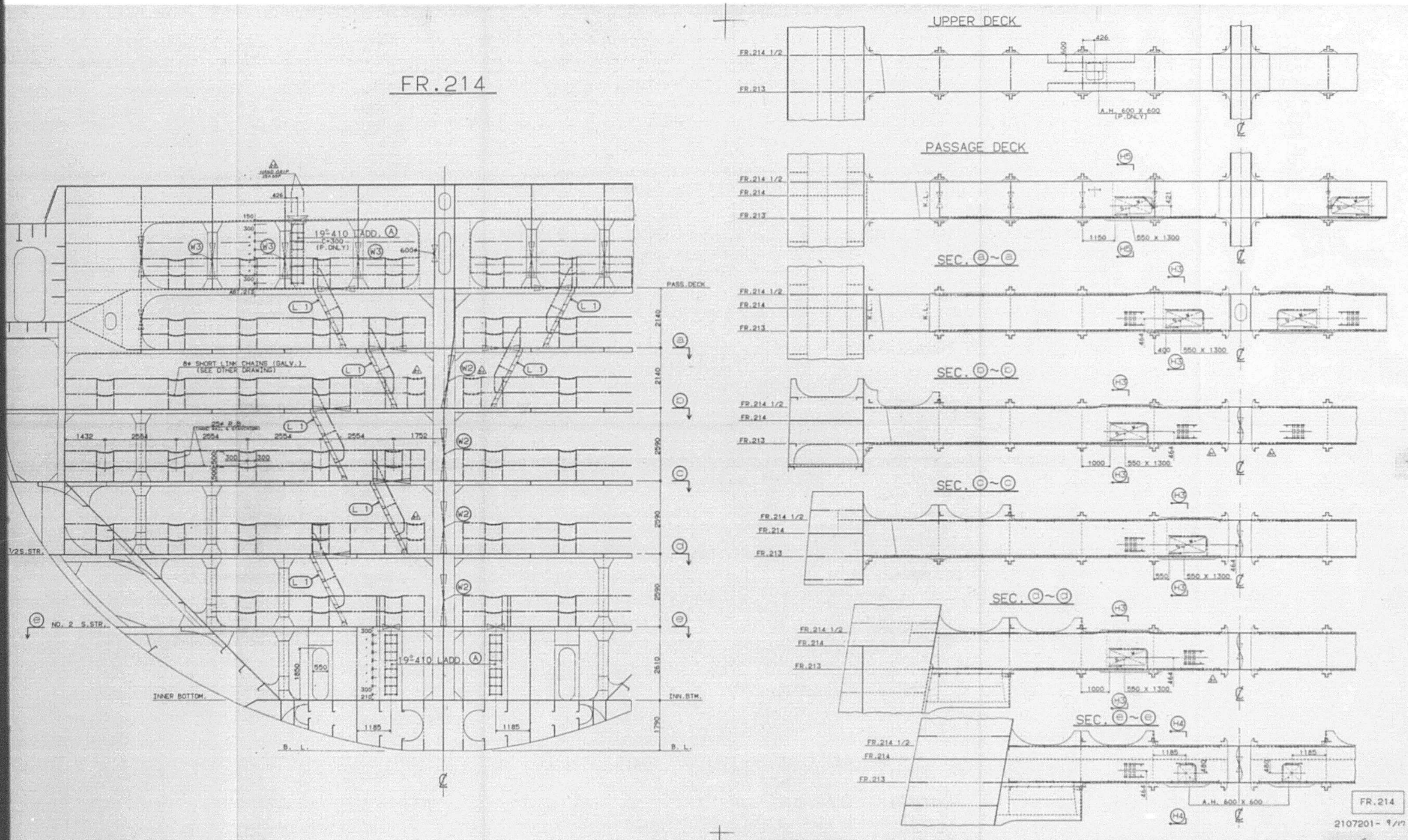

FR.178
UPPER DECK
PASSAGE DECK
SEC. a~a
SEC. b~b
SEC. c~c
SEC. d~d
SEC. e~e
19-410 LADD. A
PASSAGE DECK
INNER BOTTOM
INN. BTM.
B. L.
A.H. 600 X 600 (P.ONLY)
550 X 1300
FR.178
2107201- 8/17



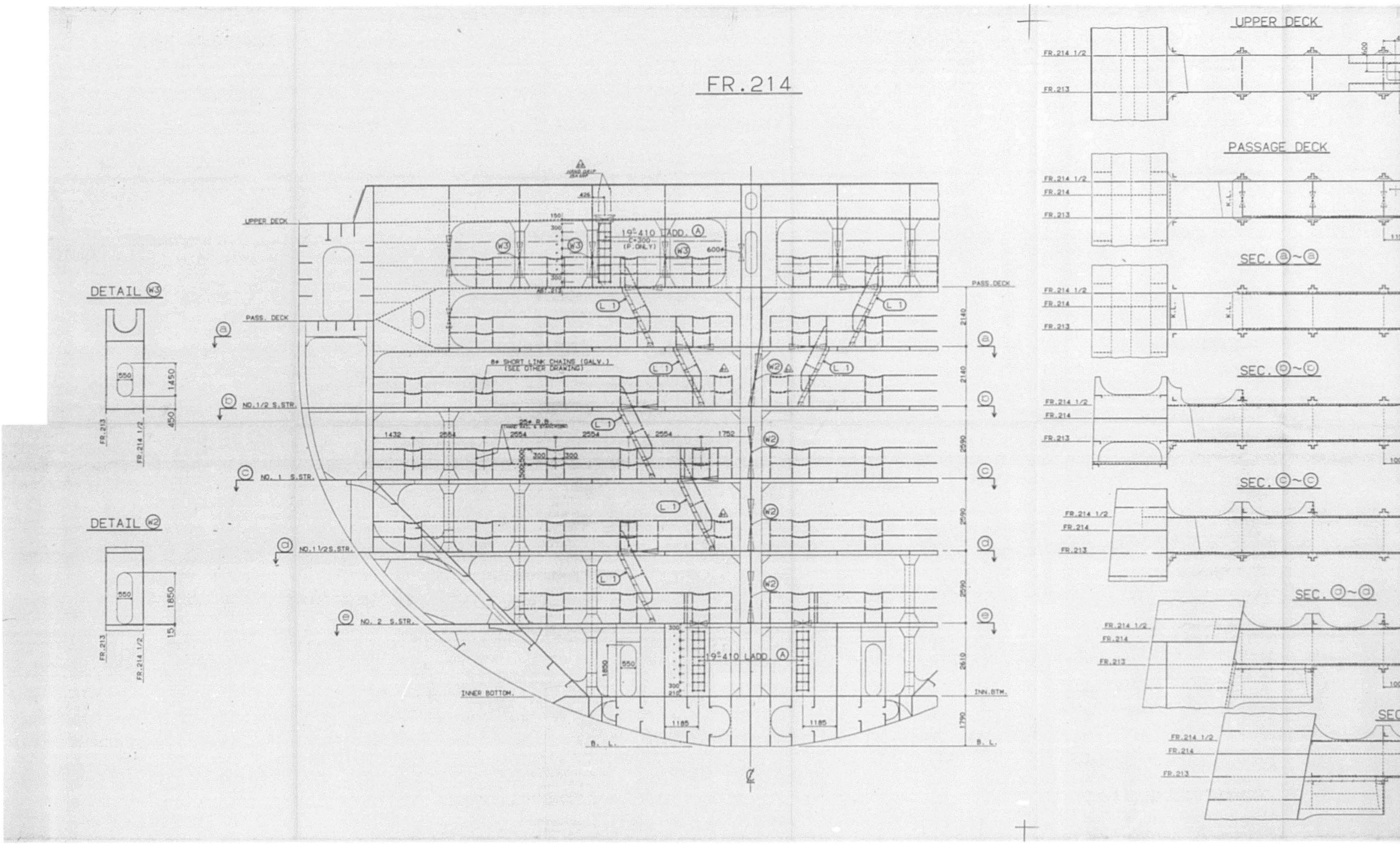
FR. 178
DETAIL W3
DETAIL W2
UPPER DECK
PASS. DECK
PASSAGE DECK
NO.1/2 S.STR.
NO. 1 S.STR.
NO.11/2S.STR.
NO. 2 S.STR.
INNER BOTTOM
INN.BTM.
B. L.
19-410 LADD. A
8φ SHORT LINK CHAINS (GALV.)
(SEE OTHER DRAWING)
UPPER DECK
PASSAGE DECK
SEC. a~a
SEC. b~b
SEC. c~c
SEC. d~d
SEC. e~e
FR.178 1/2
FR.178
FR.177

869

FR. 214

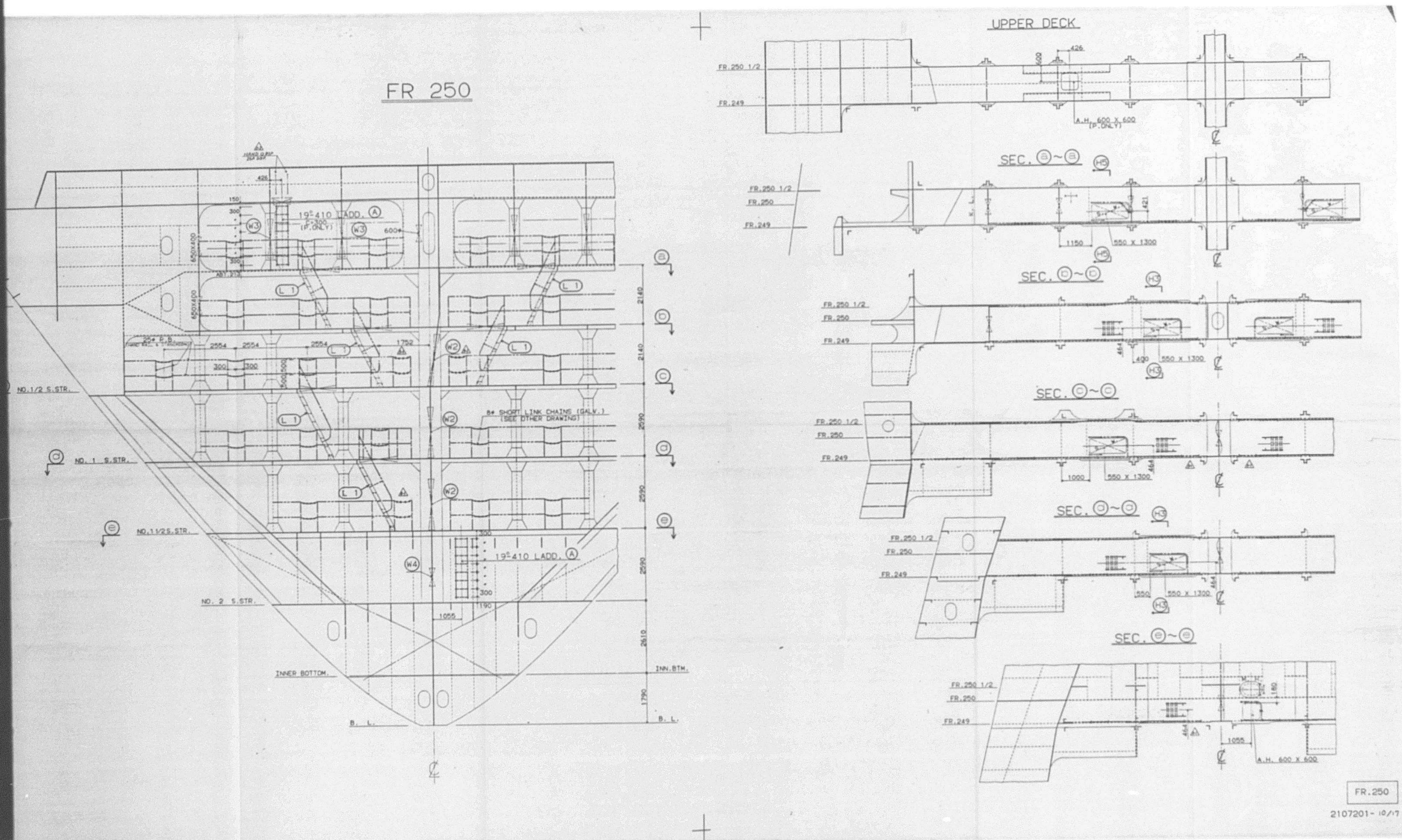


UPPER DECK
PASSAGE DECK
SEC. ⓐ~ⓐ
SEC. ⓑ~ⓑ
SEC. ⓒ~ⓒ
SEC. ⓓ~ⓓ
SEC. ⓔ~ⓔ
19-410 LADD. Ⓐ
INNER BOTTOM
PASS. DECK
INN. BTM.
B. L.
NO. 2 S.STR.
FR. 214
2107201-



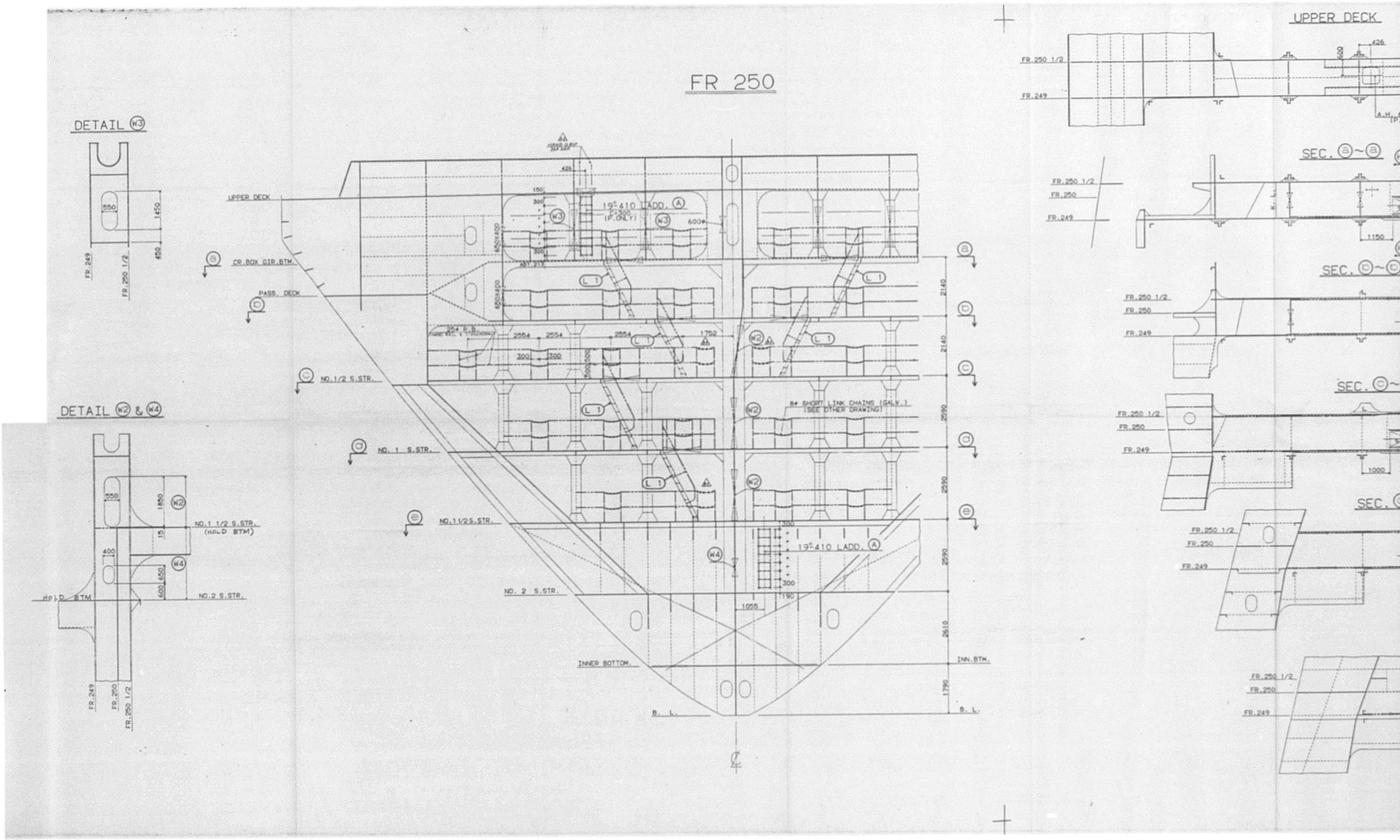
FR.214
DETAIL W3
DETAIL W2
UPPER DECK
PASS. DECK
NO.1/2 S.STR.
NO. 1 S.STR.
NO.1 1/2 S.STR.
NO. 2 S.STR.
INNER BOTTOM
INN.BTM.
PASSAGE DECK
SEC. ⓐ~ⓐ
SEC. ⓑ~ⓑ
SEC. ⓒ~ⓒ
SEC. ⓓ~ⓓ

871

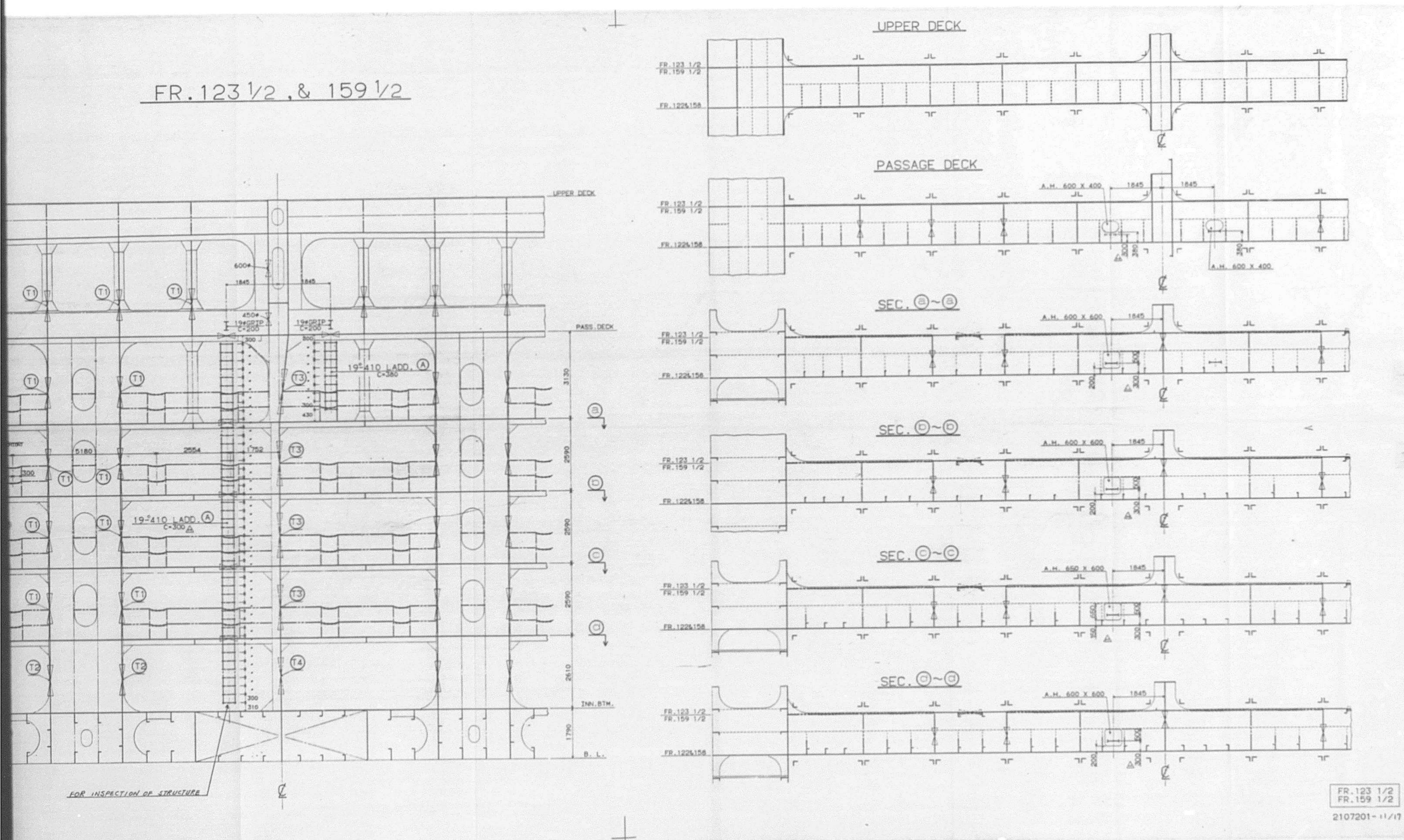


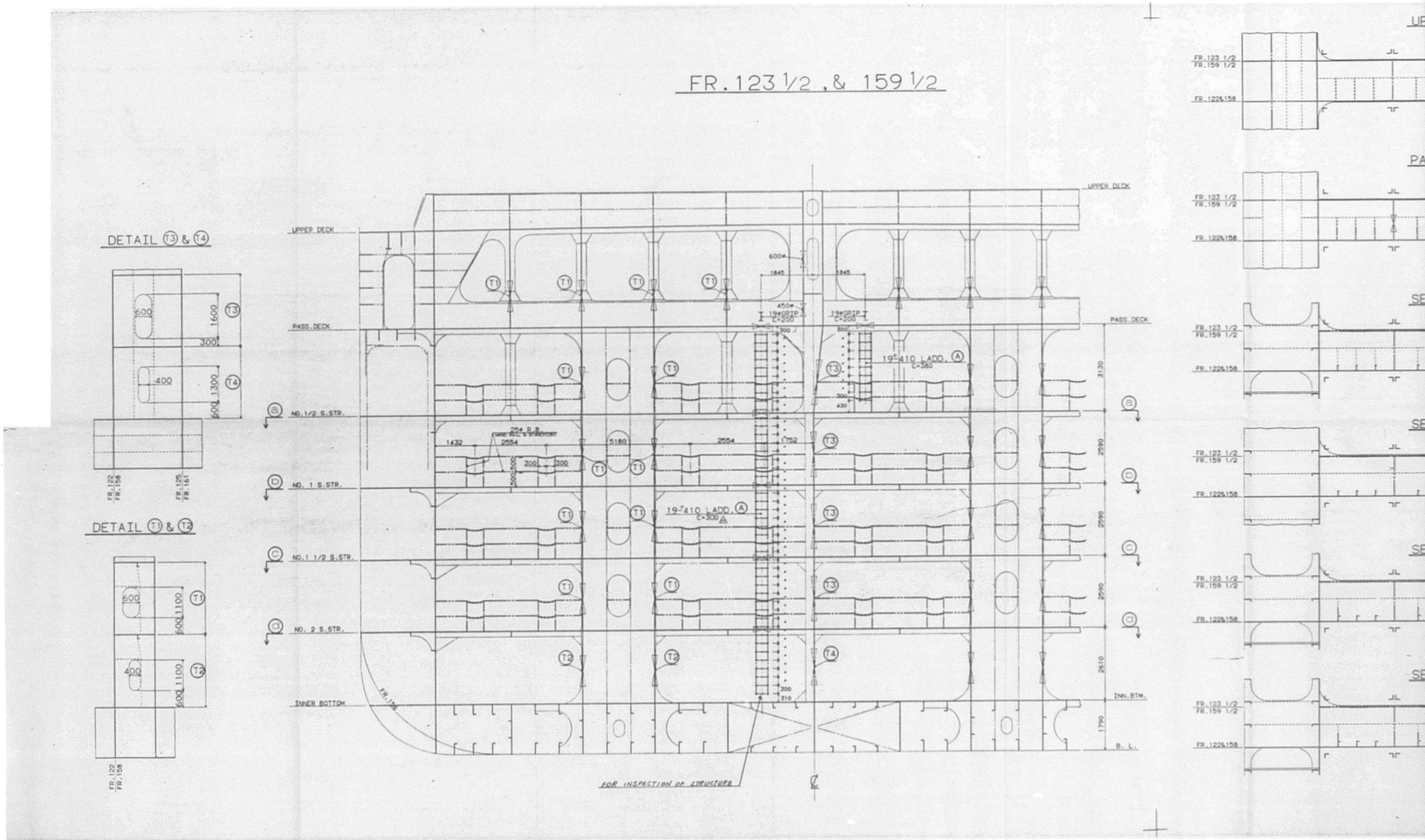
FR 250
UPPER DECK
SEC. ⓐ~ⓐ
SEC. ⓑ~ⓑ
SEC. ⓒ~ⓒ
SEC. ⓓ~ⓓ
SEC. ⓔ~ⓔ
19ᴱ410 LADD. Ⓐ
19ᴱ410 LADD. Ⓐ
NO.1/2 S.STR.
NO. 1 S.STR.
NO.1 1/2 S.STR.
NO. 2 S.STR.
INNER BOTTOM
INN.BTM.
B. L.
FR.250 1/2
FR.250
FR.249
A.H. 600 X 600
550 X 1300
FR.250
2107201-

872



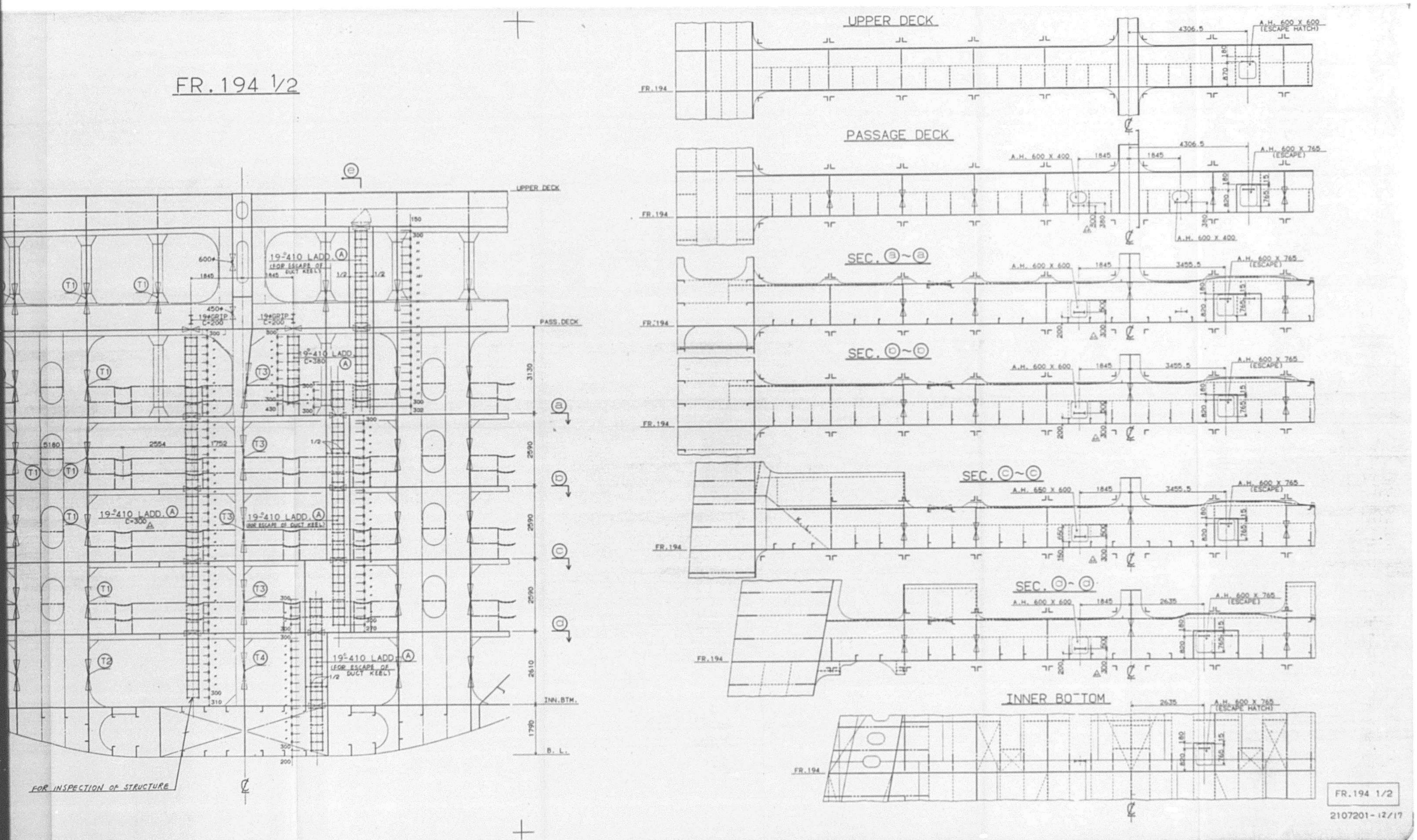
FR 250
DETAIL W3
DETAIL W2 & W4
UPPER DECK
CR.BOX GIR.BTM.
PASS. DECK
NO.1/2 S.STR.
NO. 1 S.STR.
NO.1 1/2 S.STR.
NO. 2 S.STR.
INNER BOTTOM
INN.BTM.
B. L.
19⁸410 LADD. A
8ϕ SHORT LINK CHAINS (GALV.)
(SEE OTHER DRAWING)
NO.1 1/2 S.STR.
(HOLD BTM)
NO.2 S.STR.
HOLD BTM
FR.249
FR.250
FR.250 1/2
SEC. a~a
SEC. b~b
SEC. c~c
SEC. d


FR. 123 1/2 , & 159 1/2
UPPER DECK
PASS. DECK
INN. BTM.
B. L.
19∅410 LADD. Ⓐ
FOR INSPECTION OF STRUCTURE
UPPER DECK
PASSAGE DECK
SEC. ⓐ~ⓐ
SEC. ⓑ~ⓑ
SEC. ⓒ~ⓒ
SEC. ⓓ~ⓓ
FR. 123 1/2
FR. 159 1/2
FR. 122&158
A.H. 600 X 400
A.H. 600 X 600
FR. 123 1/2
FR. 159 1/2
2107201-11/17



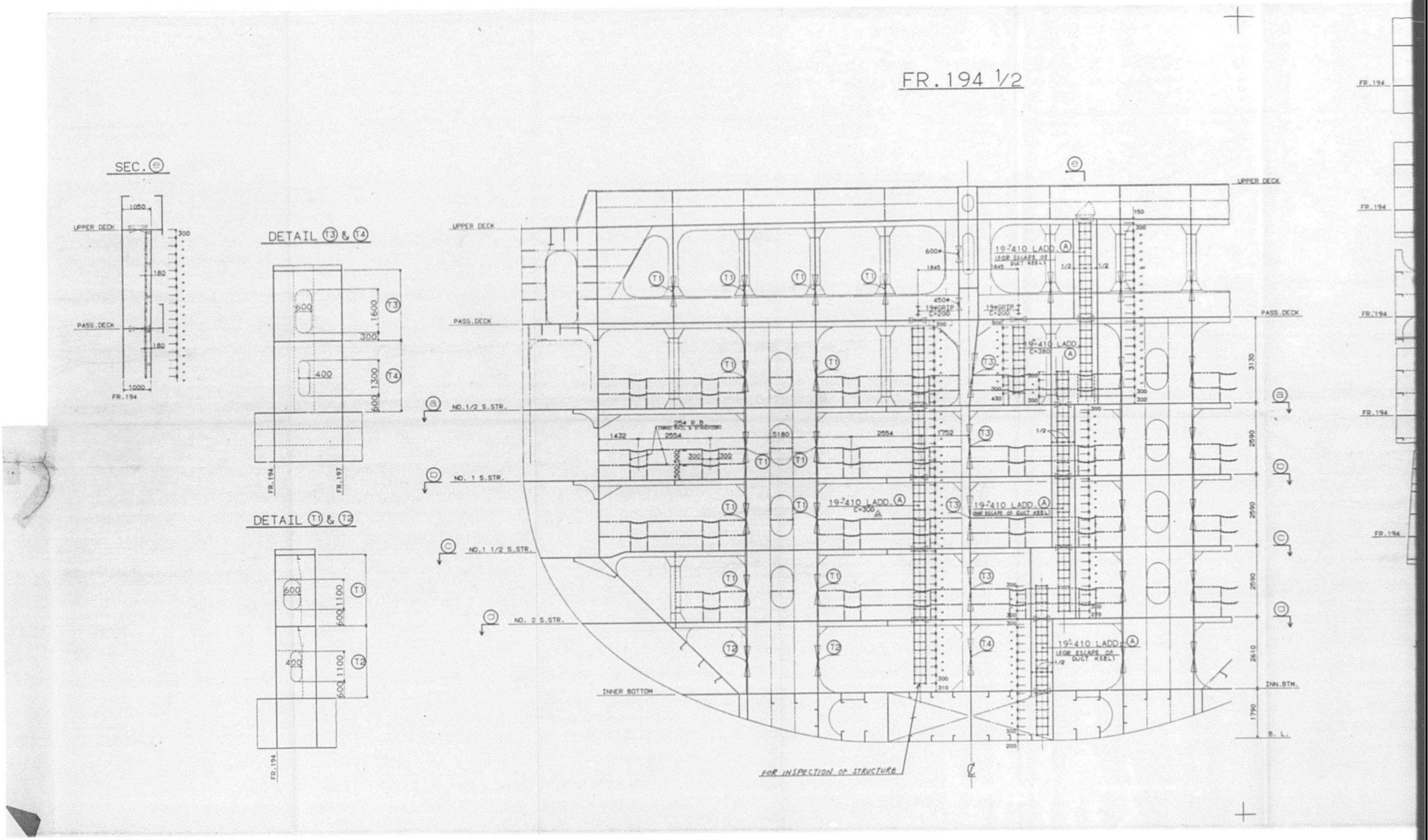
FR. 123 1/2 , & 159 1/2
DETAIL T3 & T4
DETAIL T1 & T2
UPPER DECK
PASS. DECK
NO. 1/2 S. STR.
NO. 1 S. STR.
NO. 1 1/2 S. STR.
NO. 2 S. STR.
INNER BOTTOM
INN. BTM.
B. L.
19-410 LADD. A
FOR INSPECTION OF STRUCTURE
FR. 123 1/2
FR. 159 1/2
FR. 122&158

875

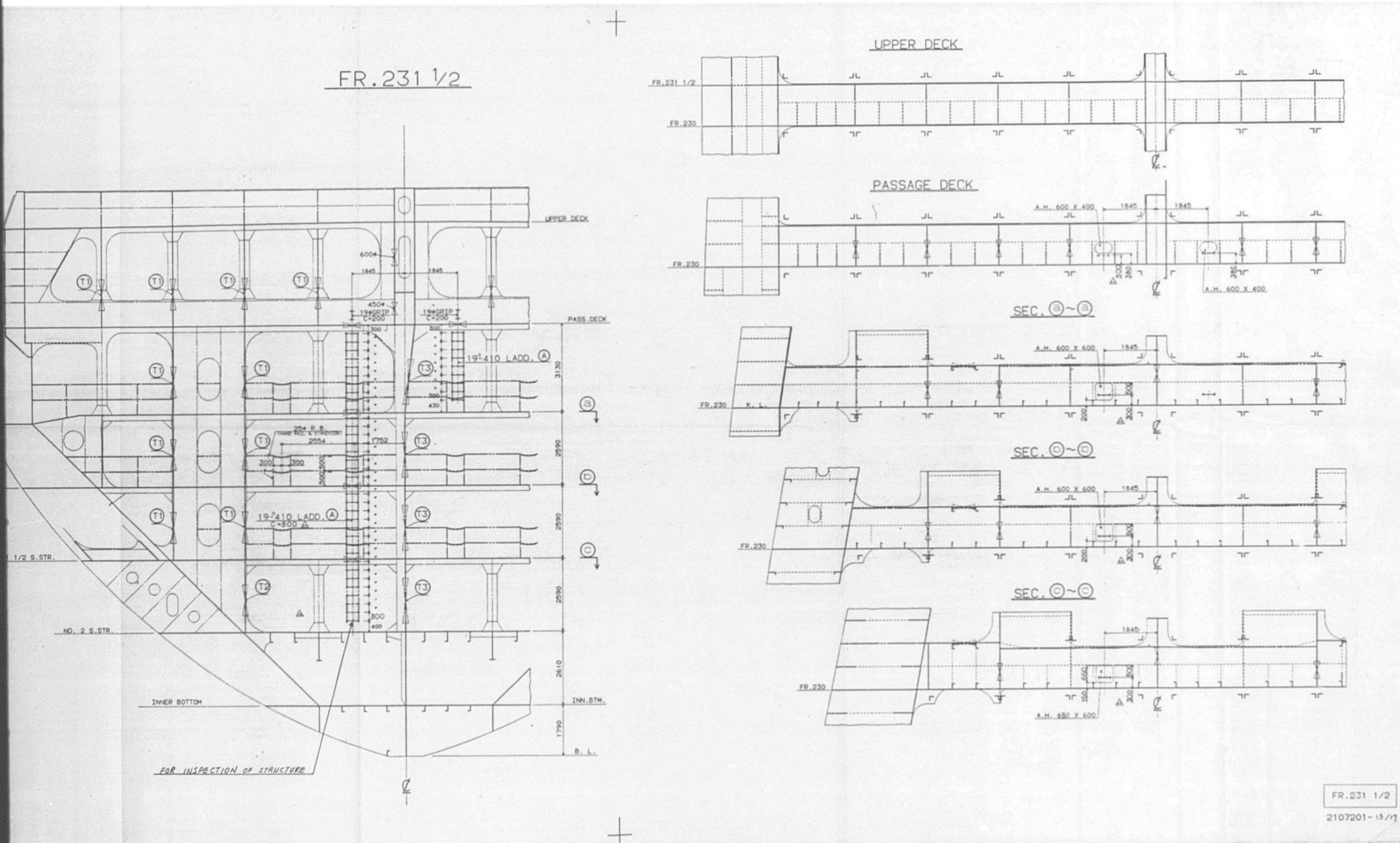


FR. 194 1/2

2107201-12/17

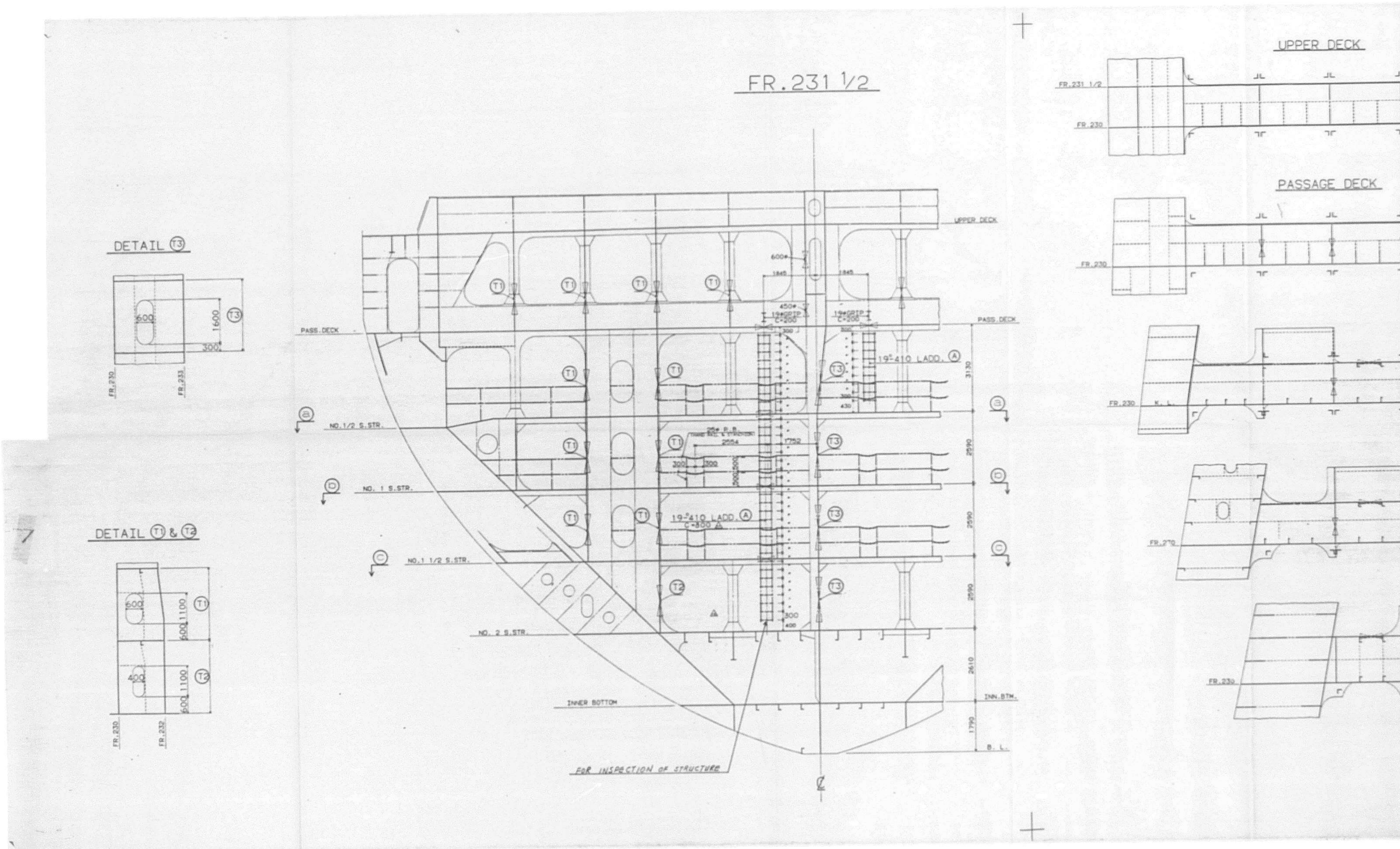

FR. 194 1/2
SEC. e
DETAIL T3 & T4
DETAIL T1 & T2
UPPER DECK
PASS. DECK
NO. 1/2 S. STR.
NO. 1 S. STR.
NO. 1 1/2 S. STR.
NO. 2 S. STR.
INNER BOTTOM
INN. BTM.
B. L.
19-410 LADD. A
FOR INSPECTION OF STRUCTURE
FR. 194
FR. 197

877



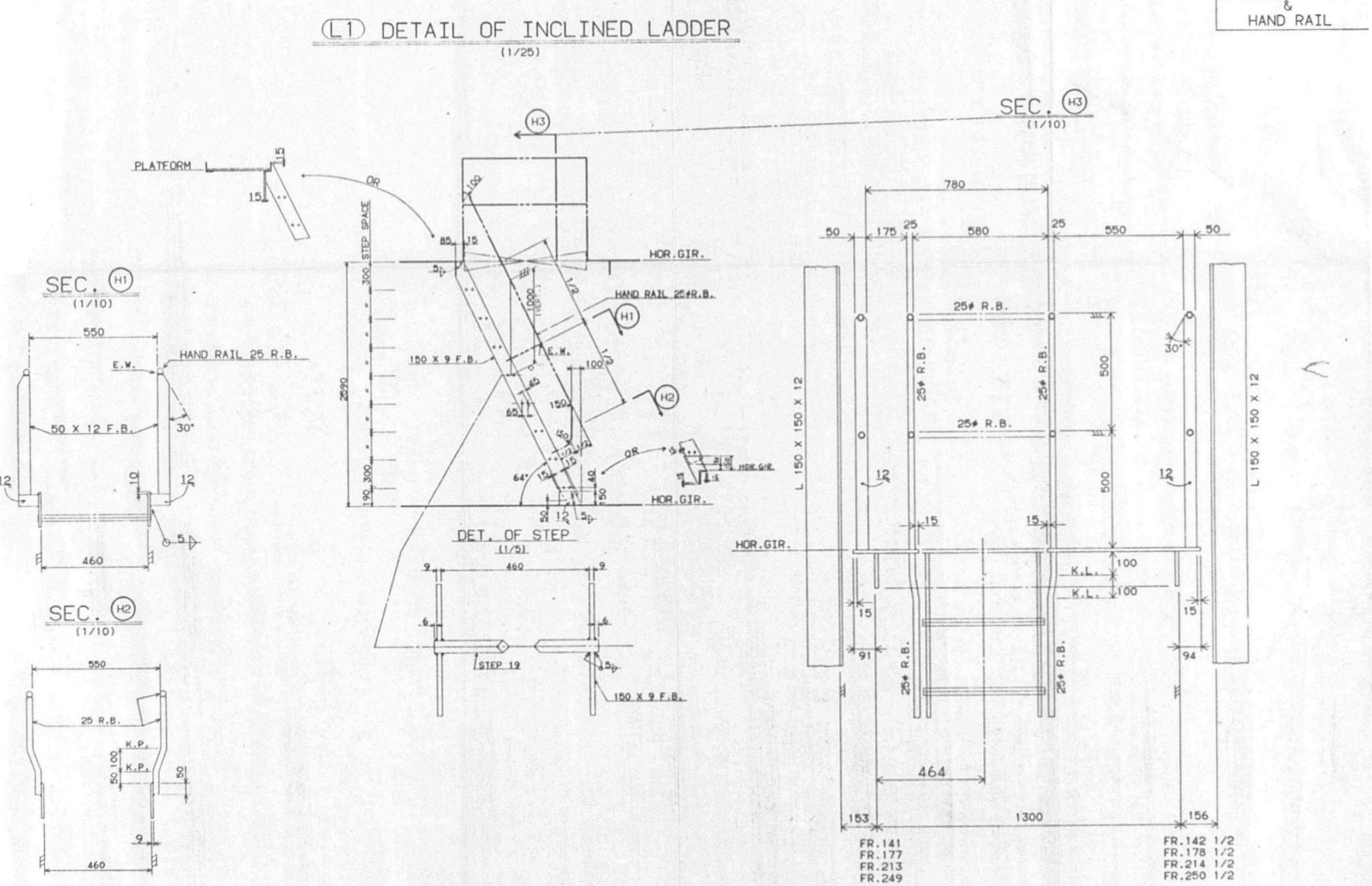
FR.231 1/2
UPPER DECK
PASSAGE DECK
SEC. ⓐ~ⓐ
SEC. ⓑ~ⓑ
SEC. ⓒ~ⓒ
PASS.DECK
INNER BOTTOM
INN.BTM.
B. L.
NO. 2 S.STR.
1/2 S.STR.
19⌀410 LADD. Ⓐ
FOR INSPECTION OF STRUCTURE
A.H. 600 X 400
A.H. 600 X 600
A.H. 650 X 600
FR.230
FR.231 1/2
2107201-13/17

878


FR. 231 1/2
DETAIL T3
DETAIL T1 & T2
UPPER DECK
PASSAGE DECK
PASS. DECK
NO. 1/2 S. STR.
NO. 1 S. STR.
NO. 1 1/2 S. STR.
NO. 2 S. STR.
INNER BOTTOM
INN. BTM.
B. L.
19-410 LADD.
FOR INSPECTION OF STRUCTURE
FR. 230
FR. 233
FR. 232

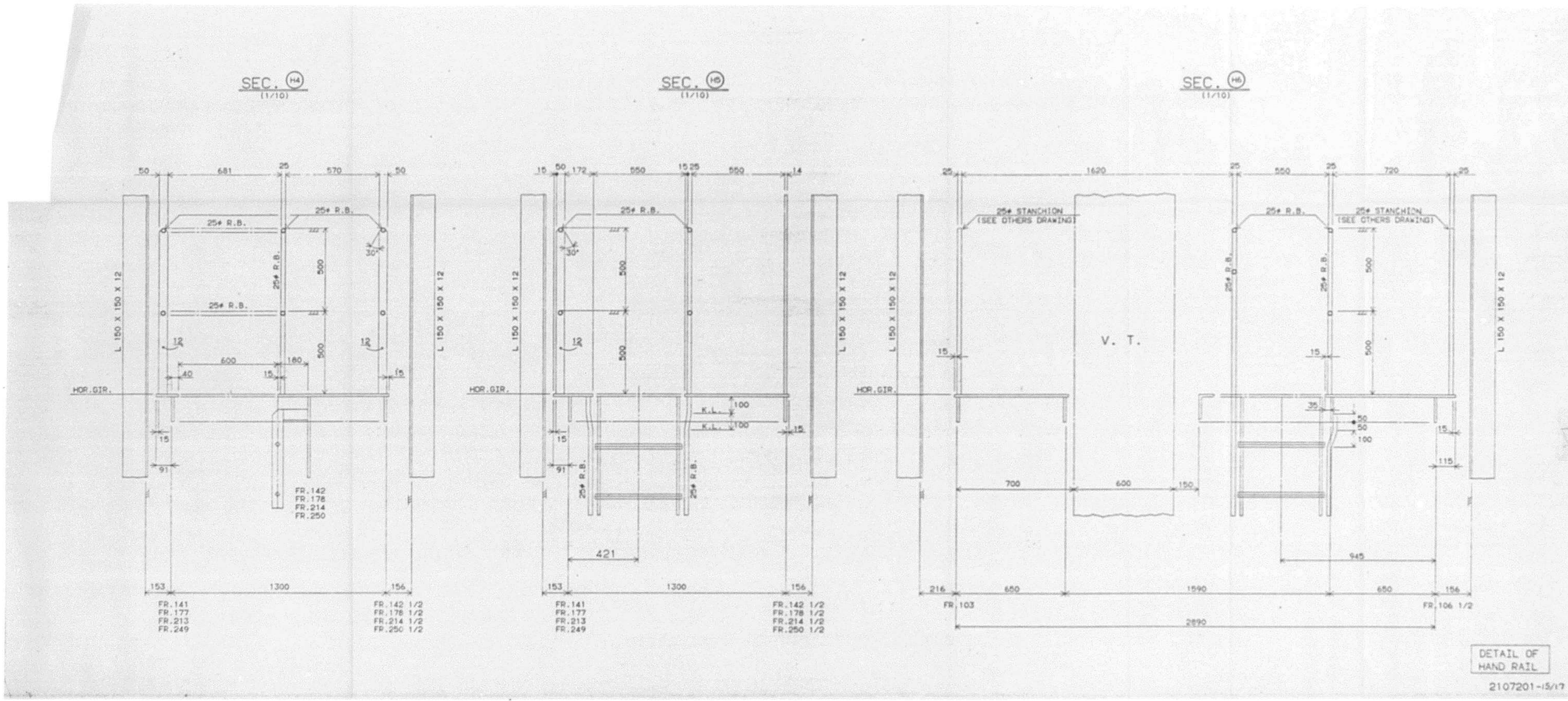
879

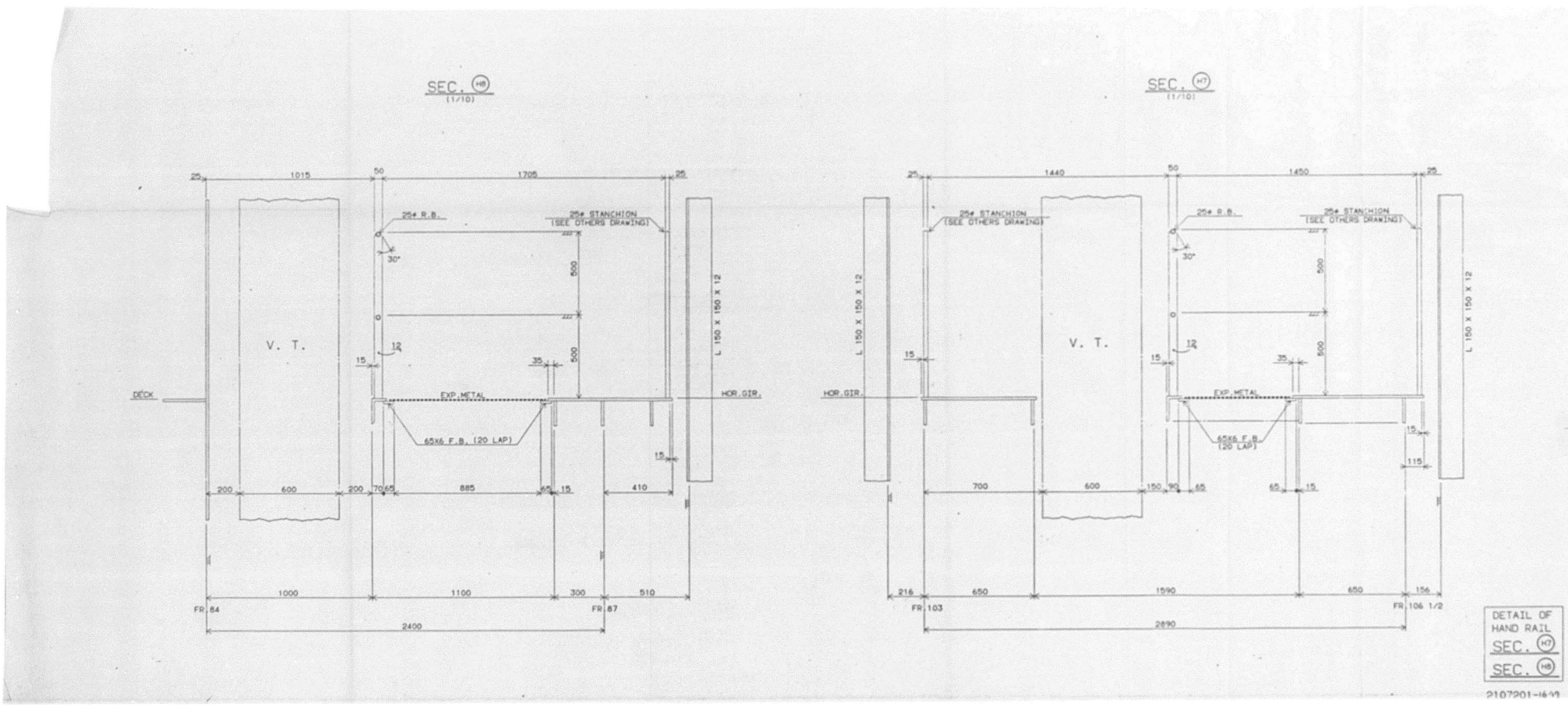
DETAIL OF INCLINED LADDER & HAND RAIL



2107201-14/17

880


SEC. H4 (1/10)
SEC. H5 (1/10)
SEC. H6 (1/10)
25φ R.B.
25φ STANCHION (SEE OTHERS DRAWING)
L 150 X 150 X 12
HOR.GIR.
V. T.
K.L.
FR.142 FR.178 FR.214 FR.250
FR.141 FR.177 FR.213 FR.249
FR.142 1/2 FR.178 1/2 FR.214 1/2 FR.250 1/2
FR.103
FR.106 1/2
DETAIL OF HAND RAIL
2107201-15/17



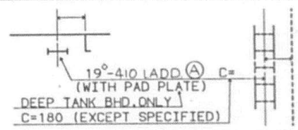
SEC. H8
(1/10)
SEC. H7
(1/10)
V. T.
25φ R.B.
25φ STANCHION
(SEE OTHERS DRAWING)
EXP. METAL
65X6 F.B. (20 LAP)
DECK
HOR. GIR.
L 150 X 150 X 12
FR. 84
FR. 87
FR. 103
FR. 106 1/2
DETAIL OF
HAND RAIL
SEC. H7
SEC. H8

882

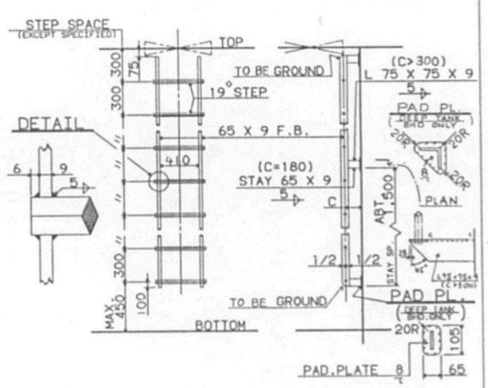
船舶設計標準

制定	39. 9. 7.	垂直梯子 Ⓐ VERTICAL LADDER	MES SD 30211
	改 52. 9. 7.		
	改 57. 11. 5.		
作成部所	玉船設一験		

MARK



DETAIL



NOTES:-
1) MATERIAL --- SS41 OR CLASSED (19° & 65 X 9 F.B.)
MATERIAL --- CLASSED (PAD PLATE)

関連規格	制定者	課長	作成者	担当
	石崎	越川	石津	田中

2107201- 17/17

ALT.NO.	OWNER DATE	OWNER LETTER NO.	USCG DATE	USCG LETTER NO.	ABS DATE	ABS LETTER NO.	USPH DATE	USPH LETTER NO.
ORIGINAL	13 JUN '85	OFTS/MES-579	–	—	26 JUN 1985	QWS/cl T-8-2		
-1	17 SEP 1985	OFTS/MES-944	9 SEP '85	MT H-00902	27 AUG 1985	QWS/hay T-8-2		

APPROVAL OF OWNER & REGULATORY BODIES

FINISHEDPLAN

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SHIPYARD AND SHIP'S NO. & NAME			
MITSUI TAMANO		MITSUBISHI KOBE	
NO.1323	DOCTOR LYKES	NO.1158	JAMES LYKES
NO.1324	ALMERIA LYKES	NO.1159	JOSEPH LYKES
NO.1325	TILLIE LYKES	NO.1164	SOLON TURMAN

MITSUI ENGINEERING & SHIPBUILDING CO.,LTD.
TAMANO WORKS

SHIP DESIGN DEPARTMENT MANAGER

OUTFITTING DESIGN SECTION

SHIP'S NO. **NO.1325** SHIP'S NAME **TILLIE LYKES**

手摺および梯子装置
ARR. OF HANDRAIL & EXT. LADDER

DATE (TEL 2235)

JOB NO. TS1323/24/25

SCALE

LYKES REF. NO. 160403

MITSUI DRAWING NO. 4120420

(SHEETS WITH COVER)

1/30

PLAN RECORD

ALT.NO.	MARK	ALTERATION/DESCRIPTION	DATE & SIGNATURE
1		PREPARED FOR S.NO. 1323 AS FINISHED PLAN, MADE APPLICABLE TO S.NO. 1324 AND S.NO. 1325.	NOVEMBER 20.86 (S.V.)

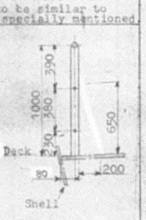
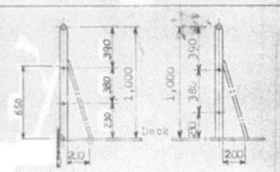
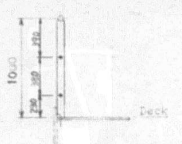
DWG.NO. 4120420 2

GENERAL NOTE

1	ACCESS IN HOLD TO BE SHOWN OTHER DRAWING 2107201 "LADDER IN HOLD".
2	STAGE & ACCESS BETWEEN HATCH WAYS TO BE SHOWN OTHER DWG 4104340 "ARR. OF STAGE FOR CONT. & STOWING BOX FOR CONT. FITTINGS"
3	REFERENCE
	DWG.No. 4120210 「ARR. OF SMALL HATCH & DOOR」
	DWG.No. 4120001-A 「ESCAPE ROUTE」
	DWG.No. 4104332 「ARR. OF CONTAINERS」
	DWG.No. 4100005 「PIPING ARR. UNDER UPP. DK. PASSAGE」
	DWG.No. 4104335 「CONTAINER POST」
	DWG.No. 5151001 「ARR. OF ENG. RM. & EMERG. GEN. RM.」 INCLUDING FLOORING & VENT. AIR DUCTING」

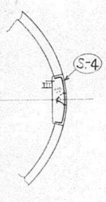
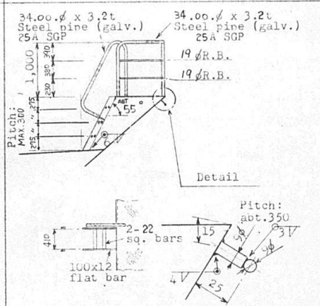
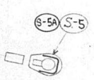
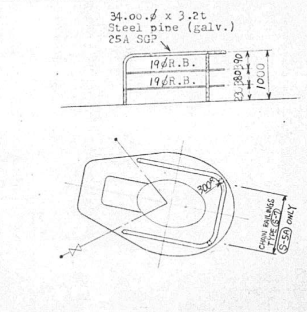
DWG.NO.4120420 3

手摺装置詳細
Details of Hand Railings

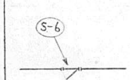
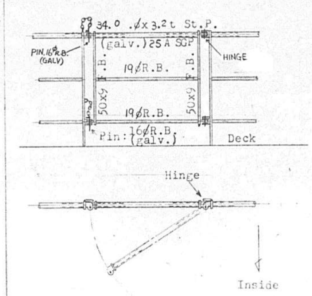
Mark & Material	Detail — 右図のものは特記の外、左図と同様とす。 Right plan to be similar to left unless specially mentioned.
(S-1) For upper deck Top rail : 34.00 ∅ x 3.2t Steel pipe (galv.) 25A SGP Mid. rail: 2 - 19∅ round bars Stanchion: 50 x 16 flat bar	
(S-2) For superstruc. deck & other acc. deck Top rail : 34.00 ∅ x 3.2t Steel pipe (galv.) 25A SGP Mid. rail: 2 - 19∅ round bars Stanchion: 50 x 16 flat bar Stay: 22∅ round bar (ENGINE CASING TOP ONLY)	
(S-3) For compass flat, MATERIAL : SUS 304 Top rail : 34.00 ∅ x 3.2t pipe 25A Mid. rail: 19∅ round bar Stanchion: 50 x 16 flat bar	

三井造船株式会社 4

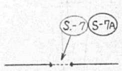
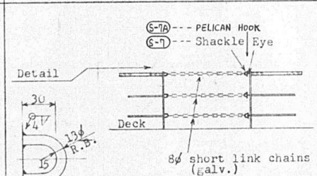
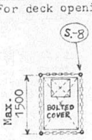
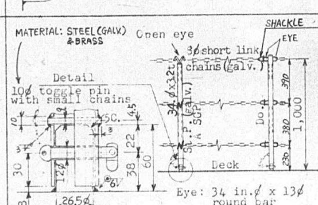
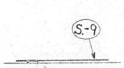
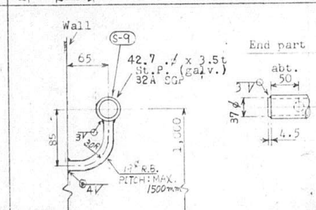
手摺装置詳細
Details of Hand Railings

Mark	Details
Bow chock part 	
Hawse pipe part 	

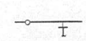
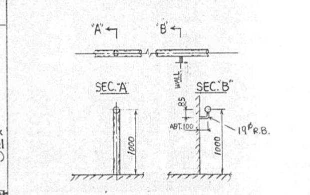
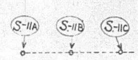
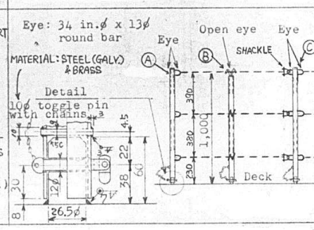
手摺装置詳細
Details of Hand Railings

Mark	Details
Door type railing 	

手摺装置詳細
Details of Hand Railings

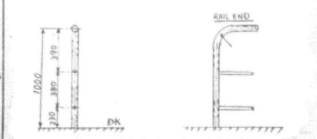
Mark	Details
Chain Railings 	
Chain Railing (For deck opening) 	
Storm Rail 	

手摺装置詳細
Details of Hand Railings

Mark & Material	Details
S-10 HANDRAIL FOR UNDER DK. PASSAGE  Top rail & Stanchion : 34.00 øx 3.2t Steel pipe (galv) 25A SGP ~~Stay: 22ø round bar~~	
S-11 CONTAINER ON DK. PART (Portable type)  Rail: 8ø SHORT LINK CHAINS (GALV) Stan.: 34.00.øx3.2t St.pipe(galv.) 25A SGP	

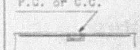
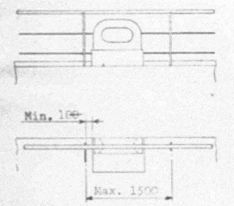
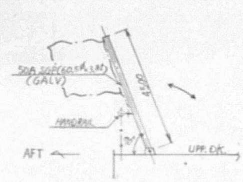
手摺装置詳細

Details of Hand Railings

Mark	Details
(S-20) FOR SWIMMING POOL Top rail : 34.00.φx AND 3.2t Steel Stanchion: pipe (GALV) Mid. rail: 2 - 19φ round bars (GALV)	

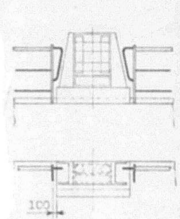
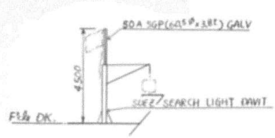
手摺装置詳細

Details of Hand Railings

Mark	Details
Panama chock or closed chock part P.C. or C.C. 	
(F-1) ENSIGN STAFF WITH SHEAVE & CLEAT FOR ROPE.	

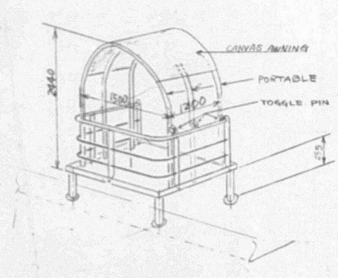
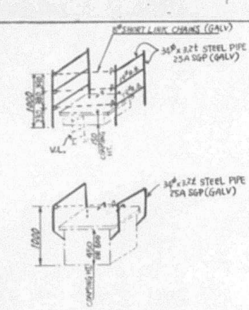
手摺装置詳細

Details of Hand Railings

Mark	Details
Universal chock part U.C. 	
(F-2) JACK STAFF (USED SUEE SEARCH LIGHT DAVIT)	

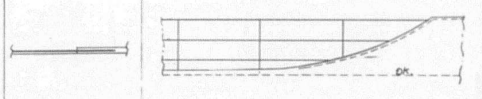
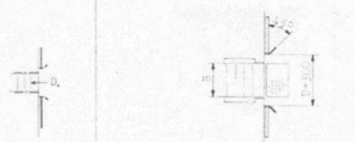
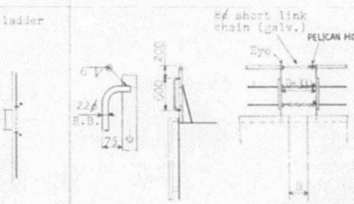
手摺装置詳細

Details of Hand Railings

Mark	Details
PANAMA CANAL PLATFORM HINGED TYPE (STAGE FRAME — PORTABLE) (F-3)	
(S-13) HAND RAIL FOR ACCESS HATCH	

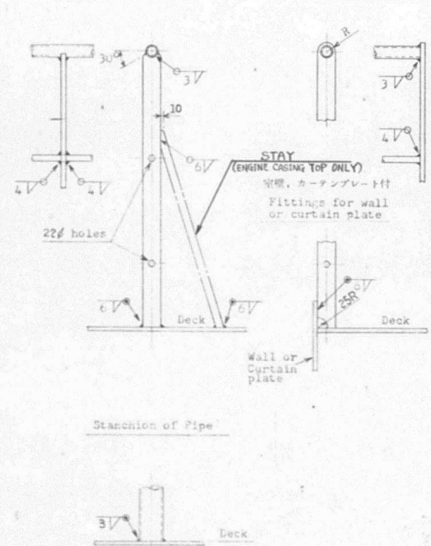
手摺装置詳細

Details of Hand Railings

Mark	Details
BULWARK part	
Inclind ladder part	
Vertical ladder part	

手摺取付け各部詳細

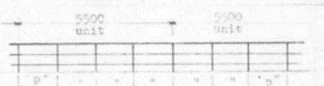
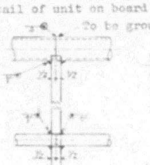
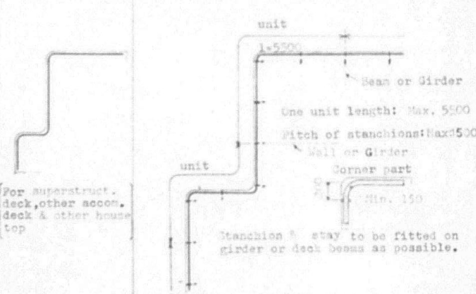
Details of Parts for Fittings of Handrailing



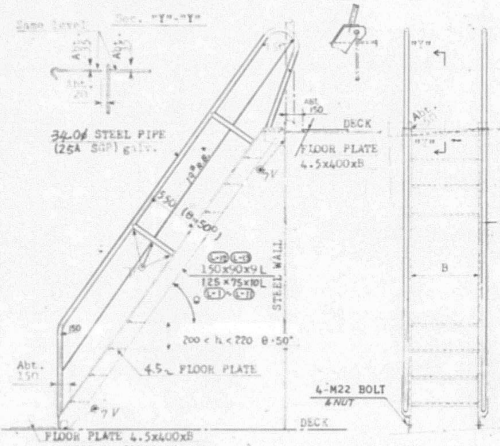
三井造船株式会社

手摺装置詳細

Details of Hand Railings

Mark	Details
Assembling of handrailing	
[Staright part for Upper deck]	Detail of unit on board  Pitch of stanchion (P) Ordinary part: 1375 Irregular part: Max. 1500 One unit length: Max. 5500
[For superstruct. deck, other accom. deck & other house top]	 One unit length: Max. 5500 Pitch of stanchions: Max. 1500 Stanchion & stay to be fitted on girder or deck beams as possible.

EXTERIOR STEEL LADDER



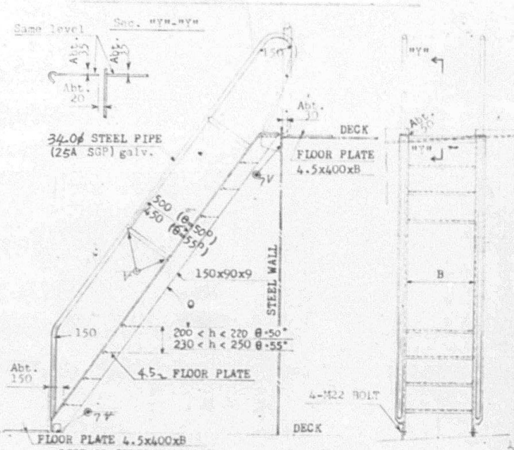
FLOOR PLATE 4.5x400xB

LIST OF STEEL LADDER

MARK	FITTING POSITION	QUANT.	B	θ	REMARKS
L-1	COMPASS FLAT ~ NAVIGATION BR. DK (C)	1	600	50°	OWNER ACCEPTED
L-2	NAVIGATION BR. DK ~ SR.OFFICERS DK. (P)	1	700		
L-3	" " " (S)	1			
L-4	SR.OFFICERS DK. ~ PASSENGER DK. (P)	1			
L-5	" " " (S)	1			
L-6	PASSENGER DK. ~ BOAT DK. (P)	1			
L-7	" " (S)	1			
L-8	BOAT DK. ~ CREW DK. (P)	1			
L-9	" " " (S)	1			
L-10	CREW DK. ~ SALOON DK. (P)	1			
L-11	" " (S)	1			
L-12	SALOON DK ~ UPP. DK. (P)	1			
L-13	" " (S)	1	700	50°	
L-22	UPP. DK. ~ STAGE (S)	1	700	55°	

鋼製梯子

INTERIOR STEEL LADDER

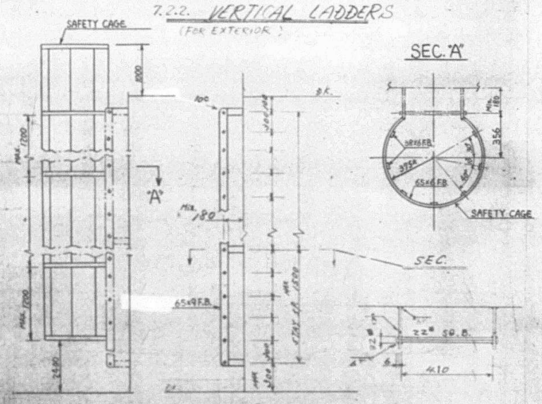


LIST OF STEEL LADDER

MARK	FITTING POSITION	QUANT.	B	θ	REMARKS
L-14	2ND. DK. ~ STAGE (ST-1) (S)	1	600	50°	
L-15	STAGE (ST-1) ~ 3RD. DK. (S)	1	↕	50°	
L-16	3RD. DK. ~ STAGE (ST-2)	1		55°	
L-17	STAGE (ST-2) ~ FWD. MACHINERY FLOOR	1		↕	
L-18	UPP. DK. ~ STAGE (ST-3)	1			
L-19	STAGE (ST-3) ~ ST.GEAR FLAT (P)	1		55°	
L-20	UNDER DK. PASSAGE ~ 〃 (P)	1 SET		50°	
L-21	〃 ~ 〃 (S)	1 SET	600	50°	

19

7.2.2. VERTICAL LADDERS (FOR EXTERIOR)



LIST OF V. LADDER

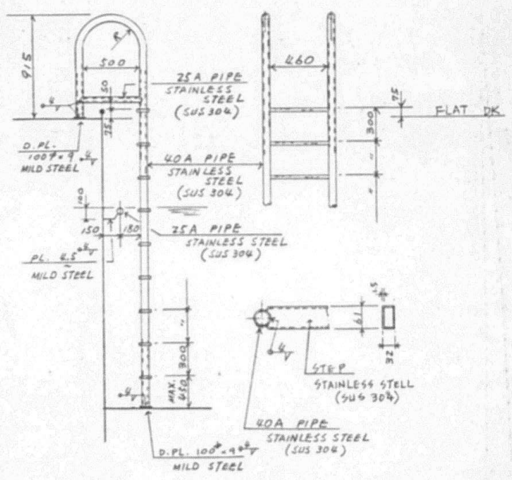
MARK	FITTING POSITION	QUANT.	REMARKS
VL-1	ENGINE CASING TOP ~ STAGE (ST-4)	1	WITH SAFETY CAGE
-2	STAGE (ST-4) ~ EMERG. GEN RM. TOP	1	
-3	EMERG. GEN. RM. TOP ~ STAGE (ST-5)	1	
-5	ENGINE CASING P. SIDE WALL ~ UPP. DK.	1	WITH SAFETY CAGE
-6	CONTAINER PLATFORM (FR.10) ~ UPP. DK. (P)	1	〃
-7	〃 ~ 〃 (S)	1	〃
-8	CONTAINER PLATFORM (FR.1) ~ 〃 (P)	1	
-9	〃 ~ 〃 (S)	1	

18

(SVL-1) VERT. LADDER & GUTTER IN SWIMMING POOL

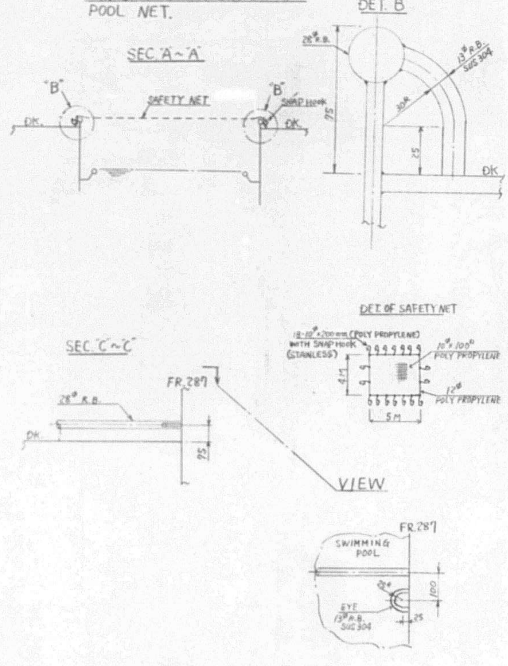
HULL-5

40A → 48.6φ x 3.5
25A → 34φ x 3.2

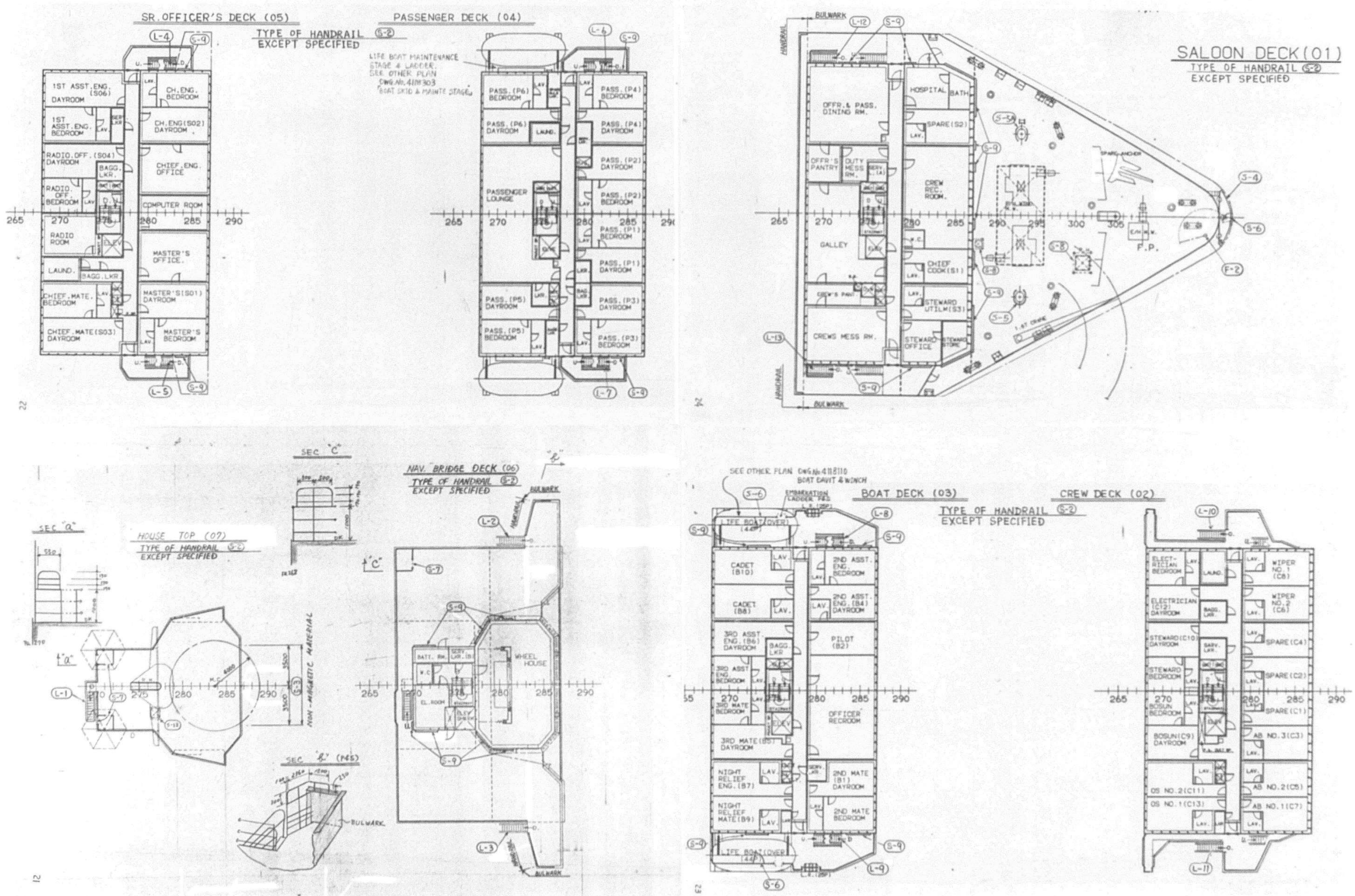


19

(SPN) ARR. OF EYE FOR SWIMMING POOL NET.

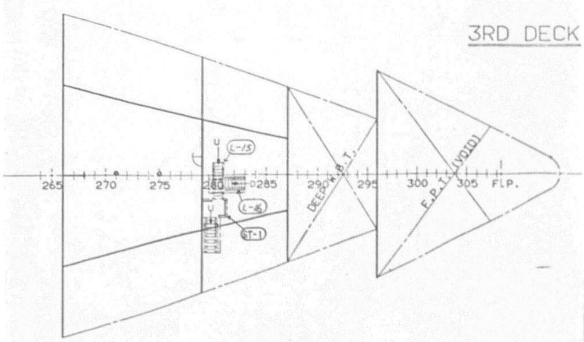


20

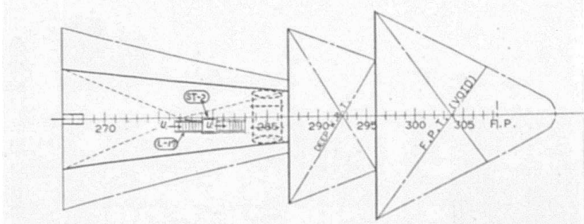

SR. OFFICER'S DECK (05)
TYPE OF HANDRAIL S-2 EXCEPT SPECIFIED
PASSENGER DECK (04)
SALOON DECK (01)
TYPE OF HANDRAIL S-2 EXCEPT SPECIFIED
HOUSE TOP (07)
TYPE OF HANDRAIL S-5 EXCEPT SPECIFIED
NAV. BRIDGE DECK (06)
TYPE OF HANDRAIL S-2 EXCEPT SPECIFIED
BOAT DECK (03)
TYPE OF HANDRAIL S-2 EXCEPT SPECIFIED
CREW DECK (02)

889

3RD DECK



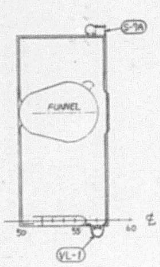
HOLD



25

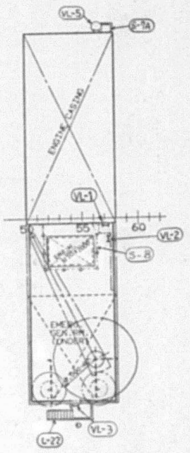
ENGINE CASING TOP

TYPE OF HANDRAIL S-2 EXCEPT SPECIFIED



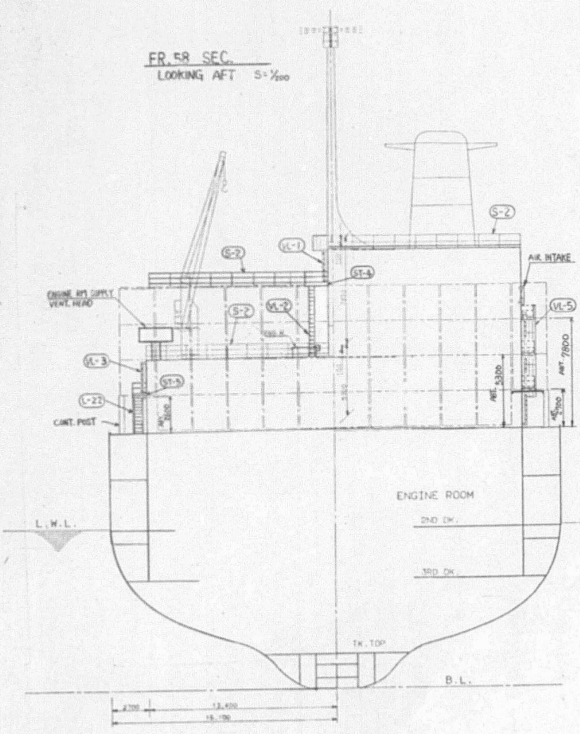
5.2 M LEVEL

TYPE OF HANDRAIL S-2 EXCEPT SPECIFIED

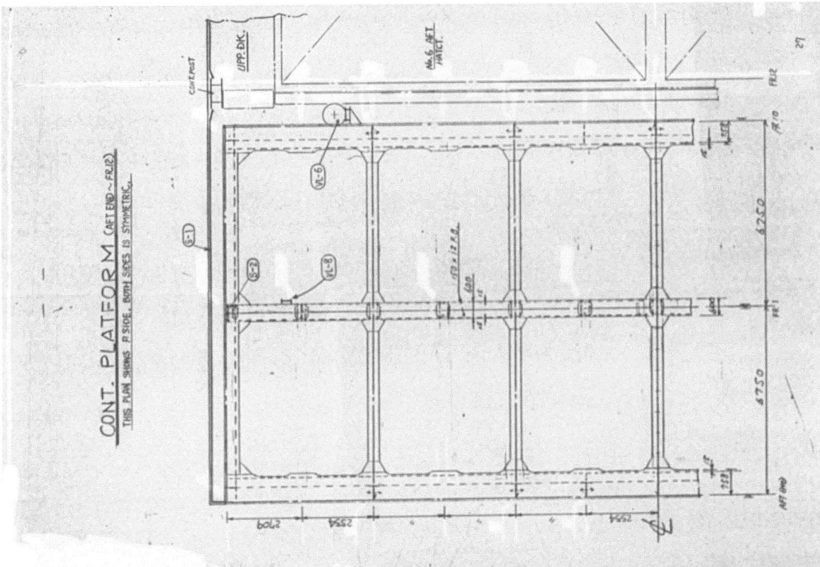


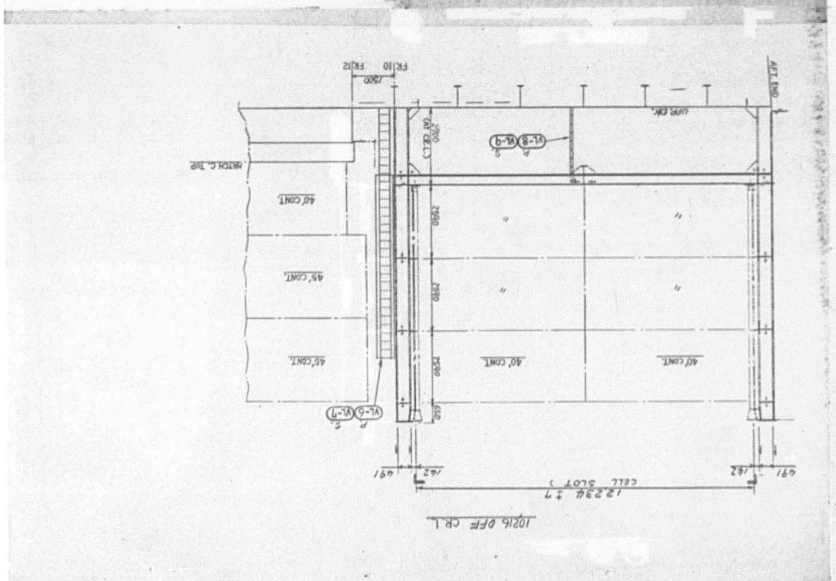
FR. 58 SEC.

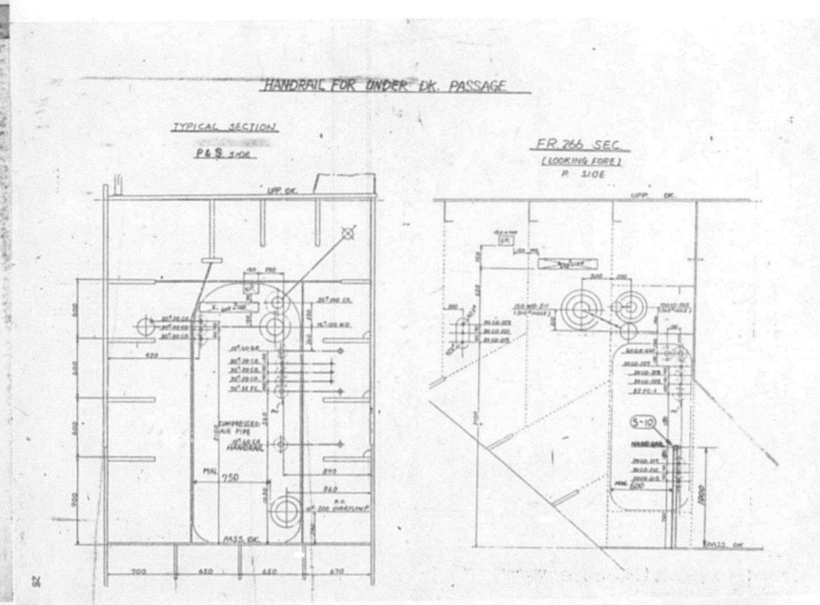
LOOKING AFT S= 1/200

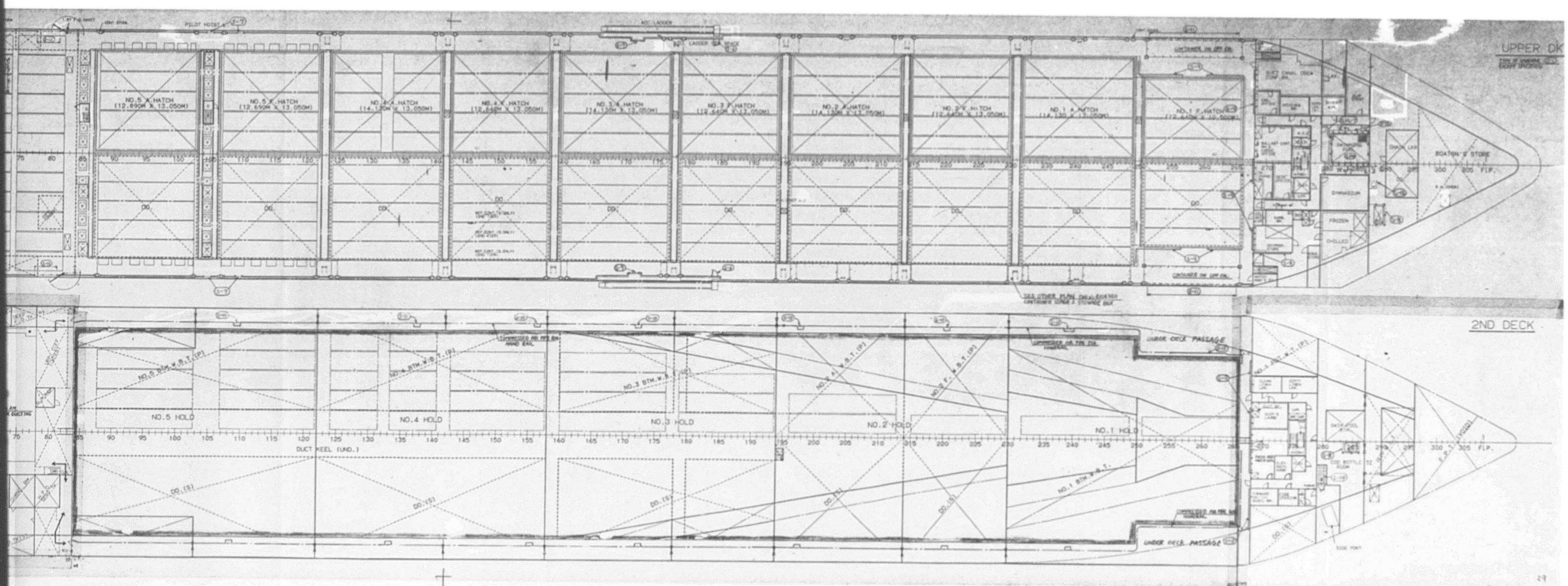


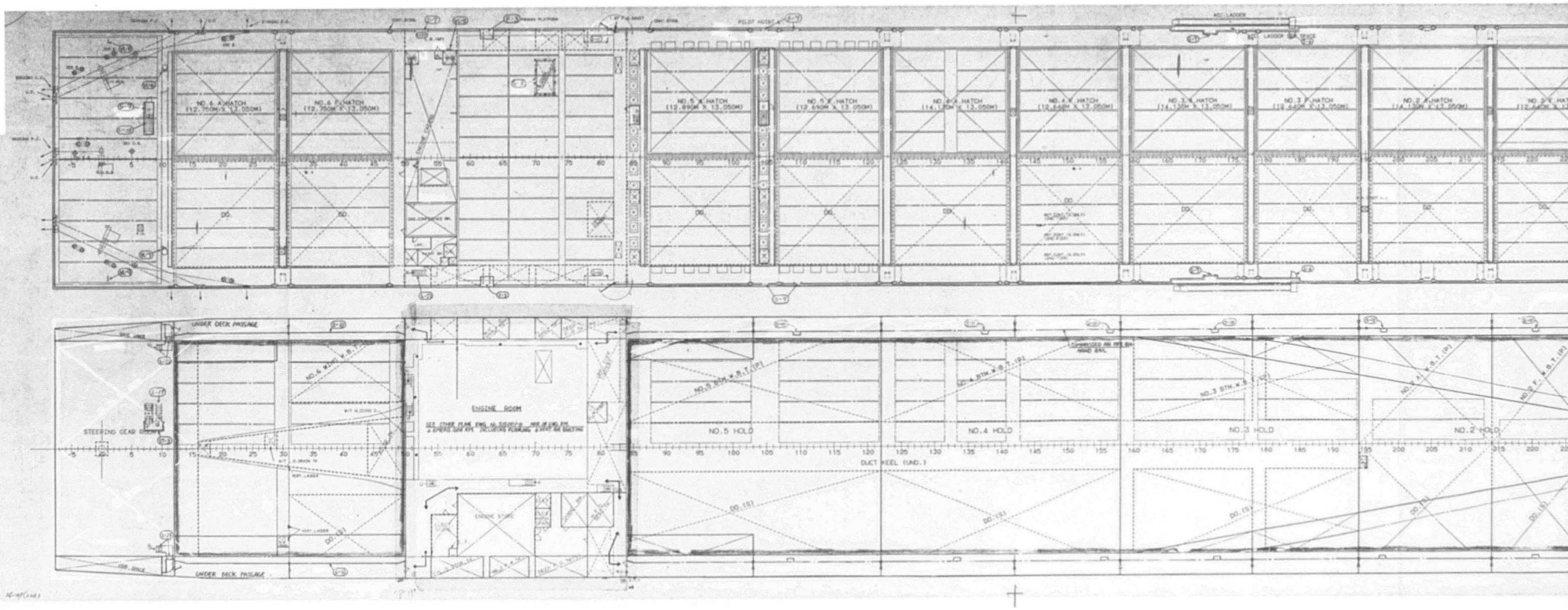
26


CONT. PLATFORM (AFT END ~ FR.12)
THIS PLAN SHOWS P.SIDE. BOTH SIDES IS SYMMETRIC.
UPP. DK.
6250
4750


40' CONT
45' CONT
CELL SLOT
10216 OFF CR.L

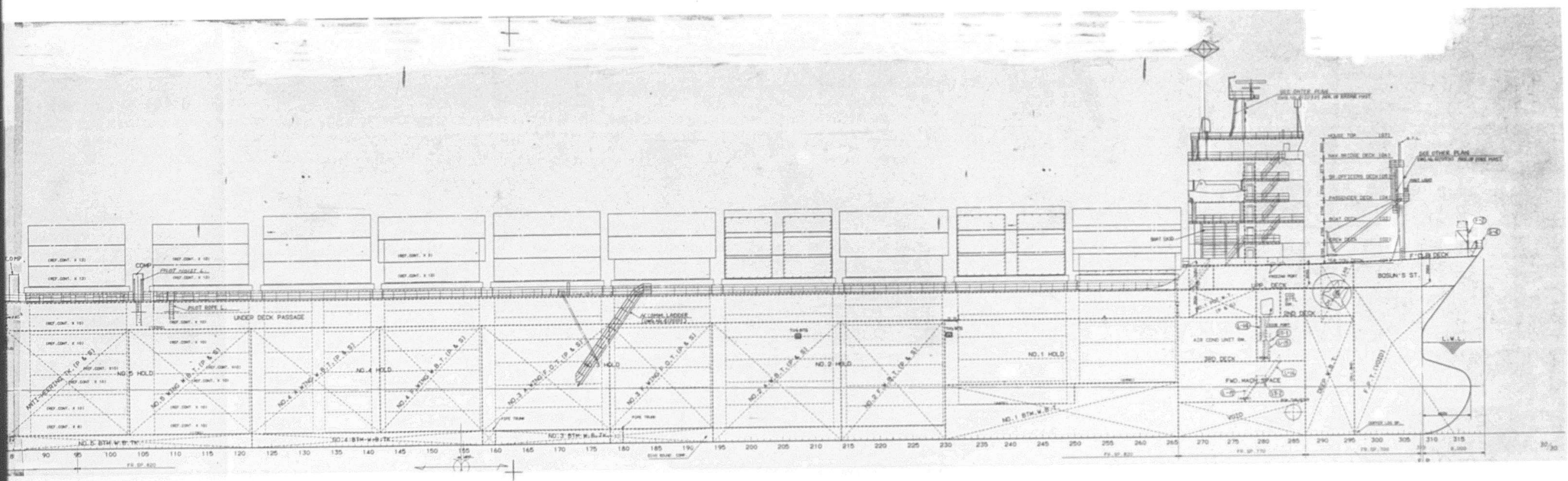

HANDRAIL FOR UNDER DK. PASSAGE
TYPICAL SECTION
P&S SIDE
FR.266 SEC.
(LOOKING FORE)
P. SIDE
UPP. DK.


UPPER DK
2ND DECK
NO.5 HOLD
NO.4 HOLD
NO.3 HOLD
NO.2 HOLD
NO.1 HOLD
UNDER DECK PASSAGE
BOATSW'S STORE

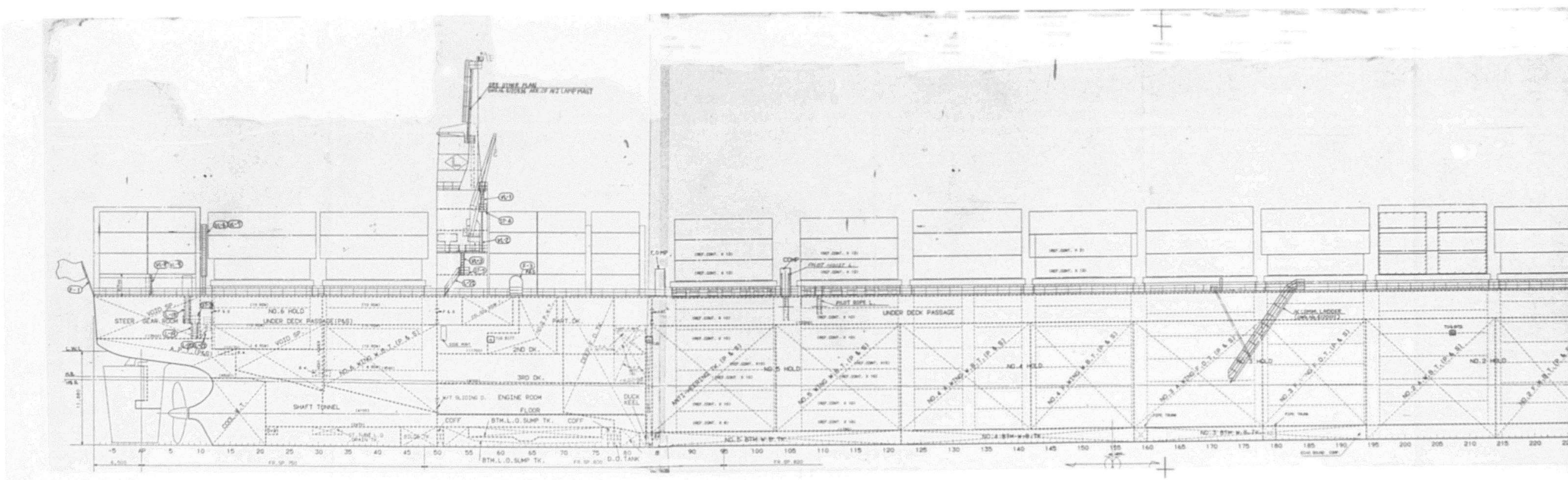

STEERING GEAR ROOM
ENGINE ROOM
ENGINE STORE
NO.5 HOLD
NO.4 HOLD
NO.3 HOLD
NO.2 HOLD
UNDER DECK PASSAGE
UNDER DECK PASSAGE
DUCT KEEL (UND.)

2/2

893


UNDER DECK PASSAGE
NO.5 HOLD
NO.4 HOLD
NO.2 HOLD
NO.1 HOLD
BOSUN'S ST.
2ND DECK
3RD DECK
FWD. MACH. SPACE
L.W.L.

894


STEER. GEAR ROOM
NO.6 HOLD
UNDER DECK PASSAGE
SHAFT TUNNEL
ENGINE ROOM
2ND DK.
3RD DK.
FLOOR
COFF
BTM.L.O.SUMP TK.
DUCK KEEL
D.O.TANK
NO.5 HOLD
NO.4 HOLD
NO.2 HOLD

APPROVAL OF OWNER & REGULATORY BODIES								
ALT.NO.	OWNER		USCG		PANAMA		USPH	
	DATE	LETTER NO.	DATE	LETTER NO.	DATE	LETTER NO.	DATE	LETTER NO.
ORIGINAL	[illegible]	[illegible]	[illegible]	[illegible]	26 JUNE '86	—		

FINISHEDPLAN

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SHIPYARD AND SHIP'S NO. & NAME			
MITSUI TAMANO		MITSUBISHI KOBE	
NO.1323	DOCTOR LYKES	NO.1158	JAMES LYKES
NO.1324	ALMERIA LYKES	NO.1159	JOSEPH LYKES
NO.1325	TILLIE LYKES	NO.1164	SOLON TURMAN

MITSUI ENGINEERING & SHIPBUILDING CO.,LTD.
TAMANO WORKS

SHIP DESIGN DEPARTMENT MANAGER — SHIP'S NO. **NO.1325** — SHIP'S NAME **TILLIE LYKES**

OUTFITTING DESIGN SECTION

パイロットラダー装置
ARR'T OF PILOT LADDER

NOV. 10.1986 — MITSUI ENGINEERING & SHIPBUILDING CO., LTD. SHIP DESIGN DEPARTMENT

DATE (TEL 2235)
JOB NO. TS1323/24/25
LYKES REF. NO. 160404
MITSUI DRAWING NO. 4120105

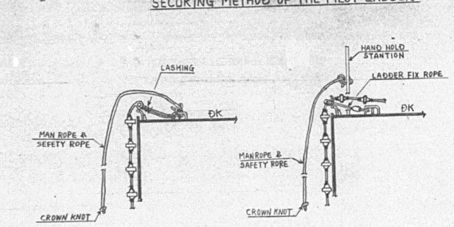
(V SHEETS WITH COVER)

PLAN RECORD

ALT.NO.	MARK	ALTERATION/DESCRIPTION	DATE & SIGNATURE
1		PREPARED FOR S.NO.1323 AS FINISHED PLAN, MADE APPLICABLE TO S.NO.1324 AND S.NO.1325.	NOVEMBER.20.86

DWG.NO.4120105

SECURING METHOD OF THE PILOT LADDER



符号 NO.	名称 NAME	材料 MATERIAL	数量 QUANTITY	記事 REMARKS
ⓚ	DAVIT FOR STOWAGE OF P. ROPE. LADDER	—	2 SETS	DWG.NO.4120106 別途手配
ⓗ	PILOT HOIST LADDER	—	2 SETS	DWG.NO.4120101 別途手配
ⓖ	ACCOMMODATION LADDER	—	2 SETS	
ⓕ	PILOT LADDER MARK	—	4	
ⓓ	HAND HOLD STANCHION	—	2 SET	
ⓒ	LASHING EYE FOR PILOT ROPE LADDER	—	8	
ⓑ	ROPE GUARD	—	8	
ⓐ	PILOT ROPE LADDER	—	2	DWG.No.4220105 別途手配

QUANTITY SHOWS / SHIP 製造個数は 1隻 分を示す (1隻分)

PILOT LADDER ARR.

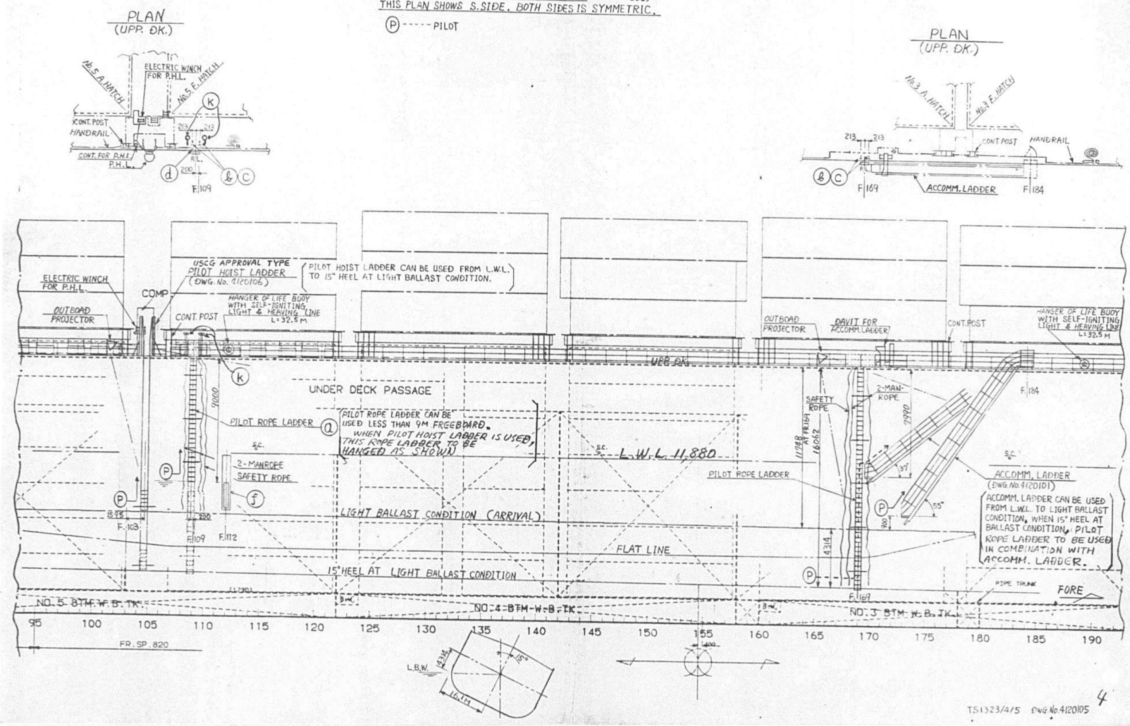
TS1323/4/5 DR.NO.4120105 PAGE 3

896

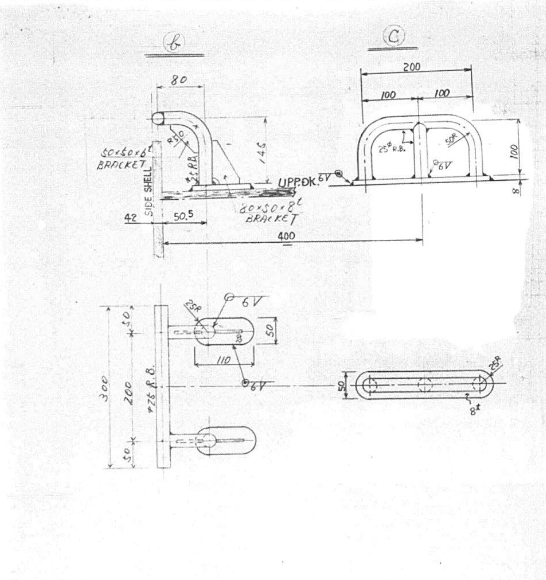
ARR'T OF PILOT LADDER (S: 1/200)

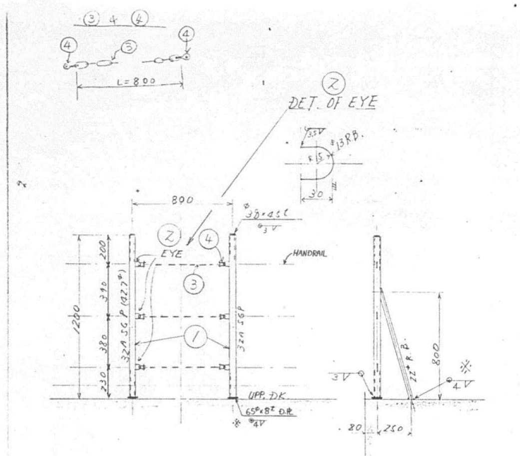
THIS PLAN SHOWS S.SIDE. BOTH SIDES IS SYMMETRIC.

Ⓟ ----- PILOT



TS1323/4/5 DWG No. 4120105 4





INFORMATION FOR SHIPYARD

符号 NO.	名称 NAME	材料 MATERIAL	試験片 TEST PIECE	常備 USE	予備 SPARE	合計 TOTAL	関係工場 WORK SHOP	1個 ONE	合計 TOTAL	記事 REMARKS
Ⓒ	LASHING EYE FOR PILOT ROPE LADDER	SS41				1	ⓜ, ㊥			
Ⓑ	ROPE GUARD	SS41				1	ⓜ, ㊥			

製造個数は 1組分を示す (1隻分) 隻分製造のこと。

Ⓑ ROPE GUARD. Ⓒ LASHING EYE FOR PILOT ROPE LADDER. 尺度 SCALE 1/50

TS1323/4/5 DR. NO. 4120105 PAGE 5

符号 NO.	名称 NAME	材料 MATERIAL	試験片 TEST PIECE	常備 USE	予備 SPARE	合計 TOTAL	関係工場 WORK SHOP	1個 ONE	合計 TOTAL	記事 REMARKS
4	SHACKLE	SS41				6	ⓜ ㊥			JIS B 2801 SC 8
3	CHAIN	SS41				3				8φ L=250 SHORT LINK CHAIN
2	EYE	SS41				6				13φ RB
1	HAND HOLD STANCHIONS	SS41 SGP				2	ⓜ ㊥			32A SGP 22φ RB

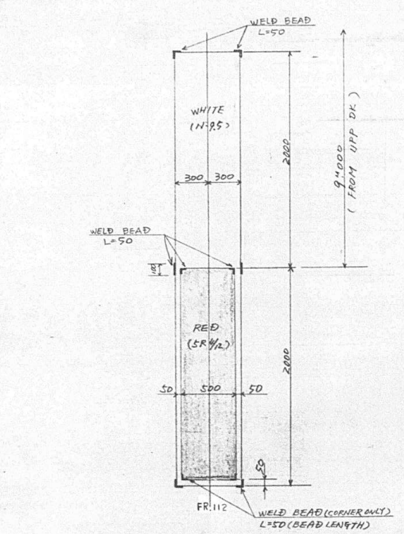
製造個数は 1組 分を示す (1隻分) 隻分製造のこと。

Ⓓ HAND HOLD STANCHION 尺度 SCALE 1/20

TS1323/4/5 DR. NO. 4120105 PAGE 6

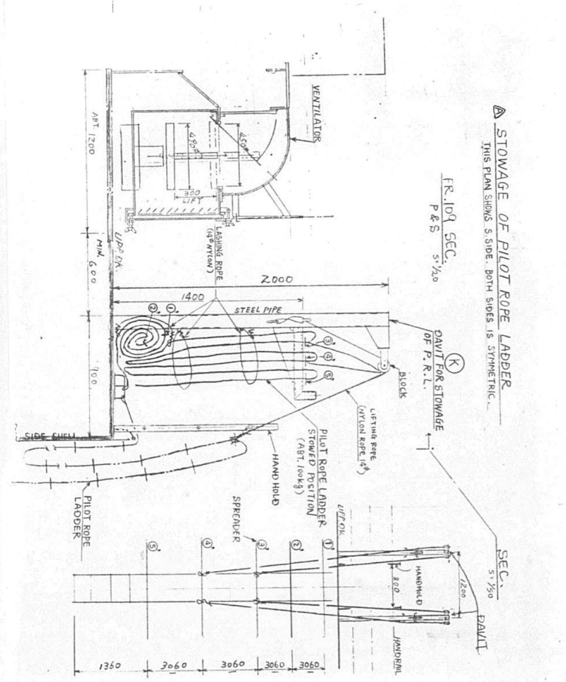
897

TS1323/4/5 DWG No 4120105 8/8



WORKING NOTE
1) ビード溶接は総組段階で船エ一内(組)にて施エのこと.
2) 両舷対称に施エのこと.

⑤ PILOT LADDER MARK	S=1/25
TS1323/4/5	No. 4120105 PAGE 7



FINISHED DRAWING

Messrs. 三井造船株式会社 玉野事業所

PILOT LADDER

L=16.66M

Hull No. 1325

Order No.

Date.

CHUO KOGYO CO., LTD.

Head Office 80 Yaraicho, Shinjuku-ku, Tokyo, Japan
TEL. Tokyo (269) 6541 ~ 3
FAX 03-269-6544
〒 162
CABLE ADDRESS KOGYOCHUOPHL

ISSUED TO	UNITED STATES COAST GUARD CERTIFICATE OF APPROVAL	EXPIRATION DATE	APPROVAL NUMBER
Coast Marine Industrial Supply, Inc. 398 Jefferson Street San Francisco, CA 94133	for Pilot Ladder	31 March 1991	163.003/4/0
		Supersedes Appr. 163.003/4/0 dated 16 February 1983 to show change in list of assembles.	

DESCRIPTION
COMAR/MARK/I Pilot Ladder, all-synthetic construction, with 3/4 in. dacron jacketed orange safety core rope suspension members, and solid one-piece steps and spreaders of "RIM" injection molded polyurethane plastic with internal reinforcement. Steps attached to suspension members with "Comar Wedge" assemblies. Ladder assembled by:
Coast Marine & Industrial Supply, Inc., San Francisco, CA (COMAR SFC)
South Haven Service, Inc., Brookhaven, NY (COMAR NYC)
Texas Marine & Industrial Supply, Houston, TX (COMAR HOU)
Chuo Kogyo Ltd., No. 80 Yaraicho, Shinjuku-Ku, Tokyo 162 Japan (COMAR JPN)

REMARKS Maximum ladder length 90 ft. Replaces Type I Embarkation-Debarkation Ladder formerly approved under 160.017. Steps molded by RIM Specialties, Midland, PA. Test and inspections conducted by Underwriters Laboratories. Each step has UL marking.

IDENTIFYING DATA Coast Marine and Industrial Supply dwg. No. 2 dated 26 December 1978, and UL Report MQ 410 dated 14 September 1981 with revisions through 13 August 1982.

THIS IS TO CERTIFY THAT the above named manufacturer has submitted to the undersigned satisfactory evidence that the item specified herein complies with the applicable laws and regulations as outlined on the reverse side of this Certificate, and approval is hereby given. This approval shall be in effect until the expiration date hereon unless sooner canceled or suspended by proper authority.

Given Under My Hand This 31st Day of March 1986, at Washington, D.C.

BY DIRECTION OF THE COMMANDANT
R. L. MARKLE, CHIEF, SURVIVAL SYSTEMS BR.
Office of Merchant Marine Safety, U.S.C.G.

DEPT. OF TRANSP., USCG, CGHQ 10030 (Rev. 5-85) PREVIOUS EDITION MAY BE USED

ISSUED TO	UNITED STATES COAST GUARD CERTIFICATE OF APPROVAL	EXPIRATION DATE	APPROVAL NUMBER
Coast Marine & Industrial Supply Co. 398 Jefferson St. San Francisco, CA 94133	for Chain Ladder Equivalent	31 March 1991	160.017/57/0
		Supersedes Appr. 160.017/57/0 dated 30 November 1983 to add new assembler.	

DESCRIPTION
Comar Debarkation Ladder - synthetic construction with 3/4 dacron jacketed orange safety cor rope suspension members. Solid one-piece steps of "RIM" injection molded polyurethan plastic with internal reinforcement. Steps attached to suspension members with "Comar Wedge" assemblies. Ladder assembled by:
Coast Marine and Industrial Supply Inc., San Francisco, CA (COMAR SFC)
South Haven Service Inc., Brooklyn, N. Y. (COMAR NYC)
Texas Marine and Industrial Supply Inc., Houston, TX (COMAR HOU)
Chuo Kogyo Ltd., No. 80 Yaraicho, Shinjuku-Ku, Tokyo 162 Japan (COMAR JPN)

REMARKS Maximum ladder length 90 ft. Test and inspection by Underwriters Laboratories. Each step has UL marine marking approved equivalent to chain ladder.

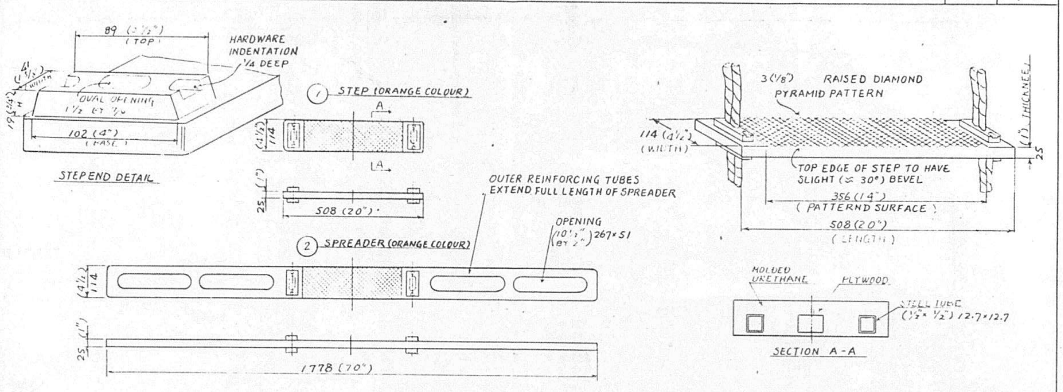
IDENTIFYING DATA Approved dwgs. and specifications in UL report MQ 622 dated 14 November 1983. Components tested under MQ 410 dated 14 Sept 1981.

THIS IS TO CERTIFY THAT the above named manufacturer has submitted to the undersigned satisfactory evidence that the item specified herein complies with the applicable laws and regulations as outlined on the reverse side of this Certificate, and approval is hereby given. This approval shall be in effect until the expiration date hereon unless sooner canceled or suspended by proper authority.

Given Under My Hand This 31st Day of March 1986, at Washington, D.C.

BY DIRECTION OF THE COMMANDANT
R. L. MARKLE, CHIEF, SURVIVAL SYSTEMS BR.
Office of Merchant Marine Safety, U.S.C.G.

DEPT. OF TRANSP., USCG, CGHQ 10030 (Rev. 5-85)



MARKS	PARTICULARS	MATERIALS	QTY.	ONE WEIGHT (Kg)	TOTAL WEIGHT (Kg)	REMARKS
2	SPREADER	MOLDED URETHANE	5	4.8	24.0	WITH STEEL REINFORCING
1	STEP	MOLDED URETHANE	44	1.6	70.4	WITH STEEL & PLYWOOD REINFORCING

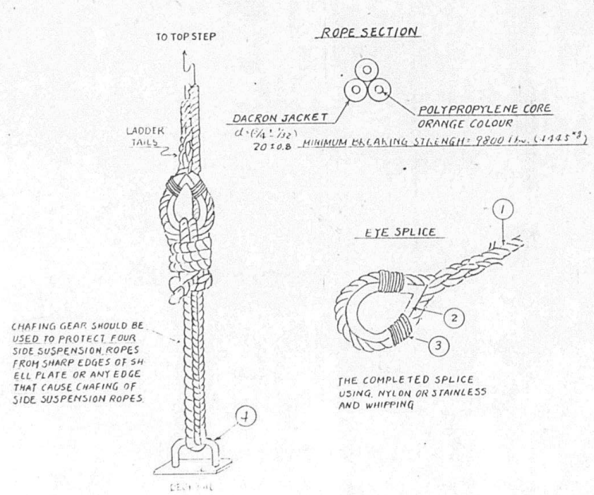
MESSRS.

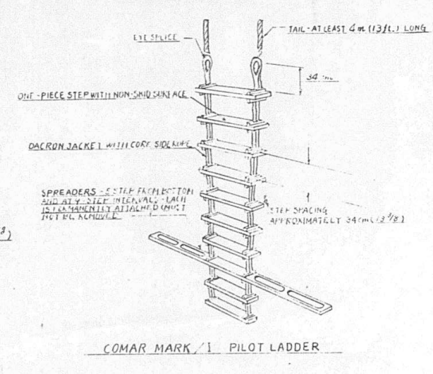
COMAR MARK I PILOT LADDER

DATE	MAY. 22. 1975		SCALE	—
CHIEF	CHECKED BY	DRAWN BY	TYPE	COMAR/MARK/I
		K. Saito	DRAWING NO.	

CHUO KOGYO CO., LTD. TOKYO

Dimensions in mm





MARKS	PARTICULARS	MATERIALS	QTY.	ONE WEIGHT (Kg)	TOTAL WEIGHT (Kg)	REMARKS
4	DECK PAD	SS41				YARD SUPPLY
3	SEIZING ROPE	NYLON	AS REQ'D			
2	THIMBLE	NYLON	2			
1	ROPE	DACRON	2	4.9	9.8	ϕ20 37.5m

MESSRS.

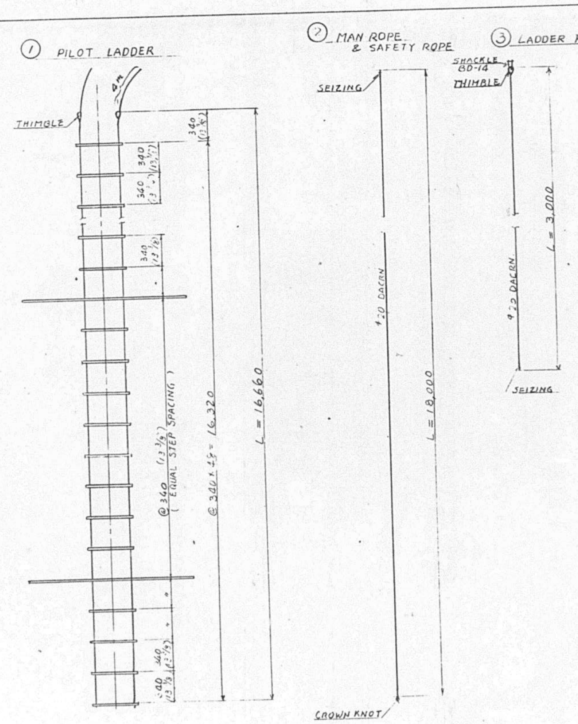
COMAR MARK I LADDER RIGGING

DATE	MAY. 22. 1975		SCALE	
CHIEF	CHECKED BY	DRAWN BY	TYPE	COMAR/MARK/I
		K. Saito	DRAWING NO.	

CHUO KOGYO CO., LTD. TOKYO

Dimensions in mm

899



COMAR/MARK/1 PILOT LADDER
U.S.C.G APPROVED No.163.003/4/0
MEET SOLAS-74 CHAPTER V REGULATION 17
(PILOT LADDERS AND MECHANICAL PILOT HOIST)

QUANTITY ---- 2 SETS PER SHIP

TW = 112.2 kg

MARKS	PARTICULARS	MATERIALS	QTY.	WEIGHT (kg) ONE	WEIGHT (kg) TOTAL	REMARKS
3	LADDER FIX ROPE	DACRON	2	0.4	0.8	φ20 L=3m
2	MAN ROPE & SAFETY ROPE	DACRON	3	2.4	7.2	φ20 L=18m
1	PILOT LADDER		1 SET	104.2	104.2	USCG APPROVED

MESSRS.			
COMAR MARK/1	LADDER ARRANGEMENT		
DATE		SCALE	
CHIEF	CHECKED BY	DRAWN BY	TYPE
			DRAWING NO.

CHUO KOGYO CO., LTD. TOKYO

Dimensions in mm

APPROVAL OF OWNER & REGULATORY BODIES

ALT. NO.	OWNER DATE	OWNER LETTER NO.	USCG DATE	USCG LETTER NO.	ABS DATE	ABS LETTER NO.	USPH DATE	USPH LETTER NO.
ORIGINAL	15 July '86	FTS/MES-723			7 Aug. '86	7-8-2		

FINISHEDPLAN

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SHIPYARD AND SHIP'S NO. & NAME

MITSUI TAMANO		MITSUBISHI KOBE	
NO.1323	DOCTOR LYKES	NO.1158	JAMES LYKES
NO.1324	ALMERIA LYKES	NO.1159	JOSEPH LYKES
NO.1325	TILLIE LYKES	NO.1164	SOLON TURMAN

MITSUI ENGINEERING & SHIPBUILDING CO., LTD.
TAMANO WORKS

SHIP DESIGN DEPARTMENT MANAGER — SHIP'S NO. — SHIP'S NAME: TILLIE LYKES

OUTFIT. DESIGN SEC. (PIPING) SEC. CHIEF / ASST. CHIEF / CHARGE / STAFF

スライディングドア
開閉用油圧管系統図
DIAGRAM OF HYD. OIL PIPE FOR OPEN/CLOSE OF WATERTIGHT SLIDING DOORS

DATE 60.7.3 (TEL 2240) — JOB NO. TS1323/24/25 — JOBCLASSIF. NO. D.20.03 — SCALE ~ — LYKES REF. NO. 160701 — MITSUI DRAWING NO. 4120301

(7 SHEETS WITH COVER) 1/7

PLAN RECORD

ALT. NO.	MARK	ALTERATION/DESCRIPTION	DATE & SIGNATURE
		PREPARED FOR S.1323 AS FINISHED PLAN,	JUNE 30,'86
		MADE APPLICABLE TO S.1324 AND S.1325.	

DWG. NO. 4120301 2/7

GENERAL NOTE

1. WORKING & TEST PRESSURE
   - WORKING PRESSURE ----- HIGH PRESS. SIDE : 56 kg/cm² (800 psi); LOW PRESS. SIDE : 9.87 kg/cm² (141 psi)
   - SET PRESSURE OF RELIEF VALVE ----- 70 kg/cm² (1000 psi)
   - AFTER INSTALLATION IN THE VESSEL HYD. TEST
     - HIGH PRESS. SIDE : 105 kg/cm² (1500 psi)
     - LOW PRESS. SIDE : 9.87 kg/cm² (141 psi) UNDER WORKING CONDITION
2. NECESSARY EXPANSION BENDS TO BE PROVIDED ON ACTUAL INSTALLATION.
3. FLUSHING TO BE CARRIED OUT FOR ALL HYD. OIL PIPES.

DWG. NO. 4120301 3/7

REFERENCE

NO.	REF. NO. MES	REF. NO. LYKES	DWG. NO.	DWG. NAME
1		480001	4116002	PIPING PRACTICE
2		190102	4116003	PIPE COLOUR IDENTIFICATION SCHEDULE
3		482601	4116004	COMPARISON TABLE OF ASTM & JIS MATERIAL FOR PIPE JOINTS
4		482602	4116005	SPECIFICATION OF NON STANDARD PIPE JOINTS FOR STEEL PIPE
5		482603	4116006	SPECIFICATION AND COMPARISON TABLE (JIS/ASTM) OF BOLTS & NUTS
6		482604	4116007	SPECIFICATION OF NON STANDARD PIPE JOINTS FOR COPPER & COPPER NICKEL PIPES
7		482605	5131201	FABRICATION METHOD FOR PIPING (WELDING, BRAZING PROCEDURE)
8		482606	5131202	COMPARISON TABLE OF JIS & ASTM MATERIAL FOR PIPE (HULL & MACHINERY PART)
9		482607	5131203	CALCULATION SHEET OF PIPE WALL THICKNESS FOR PIPING SYSTEM (GENERAL PIPING)
10		482608	5131205	GASKET (GENERAL USE)
11		482404	5233111	CAST STEEL VALVES
12		482407	5233114	BRONZE VALVES
13			5233107	DUCTILE CAST IRON VALVES
14		160205	4120213	W/T SLIDING DOOR
15				
16				
17				
18				
19				
20				

DWG. NO. 4120301 4/7

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FITTING LIST (1/1)

SYMBOL	TYPE	SERVICE	PRESS. RATE (kg/cm²)	MAX. WORK. PRESS. (kg/cm²)	WORK. TEMP. (°C)	MATERIAL BODY	MATERIAL STEM	MATERIAL DISC	NOM. DIA. MM	NOM. DIA. INCH	QTY.	LIST NO.	REMARKS
⋈	STOP VALVE	SYSTEM OIL	84	70	38	MAKER STANDARD (REF. NO. 14)			15	1/2	2	OSV-1-1~2	

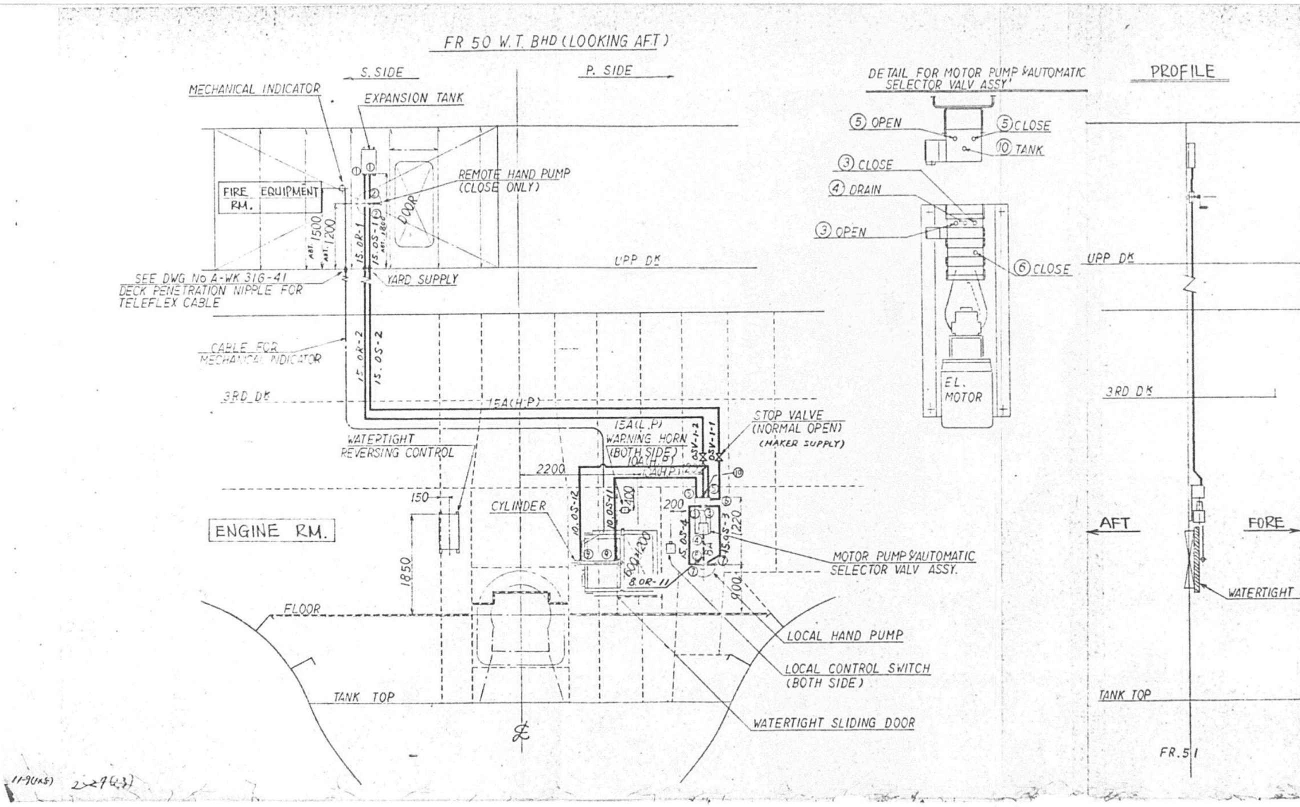
DWG. NO. 4120301 6/7

PIPING LIST (1/1)

SYSTEM (SERVICE)		MAX. WORK. PRESS (kg/cm²)	WORK. TEMP. (°C)	HYD. TEST PRESS (kg/cm²)	PIPE MATERIAL	PIPE LIST NO. STANDARD	ACT. LEN.	NOM. DIA. MM	NOM. DIA. INCH	OUT. DIA. (MM)	THICK (MM)	SCH. NO.	JOINT PRESS. STD.	JOINT TYPE	JOINT MATERIAL	USCG PIPING CLASS	AB PIPING CLASS
HYD. OIL HIGH PRESS. LINE	SYSTEM OIL	70	38	105	SEAMLESS CARBON STEEL PIPE ABS CLASSED PIPE GR. 4	OS-1-10	4	15	1/2	21.7	2.8	40	JIS 63K	SOCKET WELD FLANGE OR SOCKET WELD COUPLING OR SOCKET WELD UNION OR THREADED COUPLING OR THREADED UNION	STEEL JIS G 3201 SF 50A (EQUIV. TO ASTM A 105)	I	I
						OS-11-20	12	10	3/8	17.3	2.3	40					
HYD. OIL LOW PRESS. LINE		9.87		9.87 (UNDER WORKING CONDITION)	WELDED STEEL PIPE JIS G 3454 STPG 38-S (EQUIV. TO ASTM A53 Gr. A-S)	OR-1-10	2	15	1/2	21.7	2.8	40	JIS 10K	SLIP-ON WELD. FLANGE OR SOCKET WELD. COUPLING OR SOCKET WELD. UNION OR THREADED COUPLING	STEEL SLIP-ON WELD. FLANGE: STEEL JIS G 3101 SS41 (EQUIV. TO ASTM A36) OR SOCKET WELD. UNION/COUPLING & THREADED UNION/COUPLING: STEEL JIS G 3201 SF 50A (EQUIV. TO ASTM A 105)	II	II
						OR-11-20	11	8	1/4	13.8	2.2	40					

DWG. NO. 4120301 5/7

902



NOTE

FURNISHING THE CABLE TO BE DECIDED ON THE SPOT. USE THE CABLE IN EXCESS 24m WITH NO MORE THAN FORU (4) 90° BEND.

THE TUBING MUST BE LUBRICATED AND CAREFULLY BENT USING BEND BLOCK SUPPLIDE BY WALZ & KRENZER

注記

取付は現場調整の事.

ケーブルは90°曲げ以下で4回曲げ以内で最大長さ24m以下とする。(長さは現場で調整不可)

曲げ加工の時はBEND BLOCK (WALZ支給)を使いグリーシングの上注意深く曲げる事.

BENDING FOR M. INDICATOR CABLE

MIN R110

PIPE JOINT

No	NAME	SIZE	QTY'	REMARKS
1	EXPANSION TANK	NPT 3/4 x 15A	2	
2	REMOTE HAND PUMP	NPT 1 x 15A	2	
3	QUAD CHECK VALVE	NPT 3/8 x 15A	2	
4	QUAD CHECK VALVE	NPT 1/4 x 8 A	1	—
5	END PLATE	NPT 3/8 x 10A	2	
6	SINGLE CHECK VALVE	NPT 3/8 x 15A	1	
7	LOCAL HAND PUMP	NPT 1 x 15A	2	
8	LOCAL HAND PUMP	NPT 1/4 x 8A	1	
9	HYD' CYLINDER	NPT 3/8 x 10A	2	
10	END PLATE	NPT 3/8 x 15 A	1	

PIPE MATERIAL

8A(DRAIN)	JIS G 3454 STPG 38-S	EQUIV. TO ASTM A53A-S	YARD SUPPLY
10A(H.P)	ABS Gr.4	—	" "
15A(H.P)	"	—	" "
15A(L.P)	JIS G 3454 STPG 38-S	EQUIV. TO ASTM A53A-S	YARD SUPPLY
CABLE FOR M. INDICATOR			WALZ SUPPLY

DWG. NO. 4120301 7/7

APPROVAL OF OWNER & REGULATORY BODIES

ALT. NO.	OWNER DATE	OWNER LETTER NO.	USCG DATE	USCG LETTER NO.	ABS DATE	ABS LETTER NO.	USPH DATE	USPH LETTER NO.
ORIGINAL	24 SEP '86	TAH/80						

FINISHEDPLAN

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NO.1325	TILLIE LYKES	NO.1164	SOLON TURMAN

MITSUI ENGINEERING & SHIPBUILDING CO., LTD.
TAMANO WORKS

SHIP DESIGN DEPARTMENT MANAGER — SHIP'S NO. **NO.1325** — SHIP'S NAME **TILLIE LYKES**

OUTFITTING DESIGN SECTION

ストアークレーン用ジブレスト
JIB REST FOR STORE CRANE

DATE (TEL 3280)

JOB NO. TS1323/24/25 — SCALE 1/50, 1/25 — LYKES REF. NO. 170105 — MITSUI DRAWING NO. 4101233

(9 SHEETS WITH COVER)

1/9

PLAN RECORD

ALT. NO.	MARK	ALTERATION/DESCRIPTION	DATE & SIGNATURE
1		PREPARED FOR S.NO.1323 AS FINISHED PLAN. MADE APPLICABLE TO S.NO.1324 AND S.NO.1325.	NOVEMBER 20, '86

DWG.NO. 4101233 — 2/9

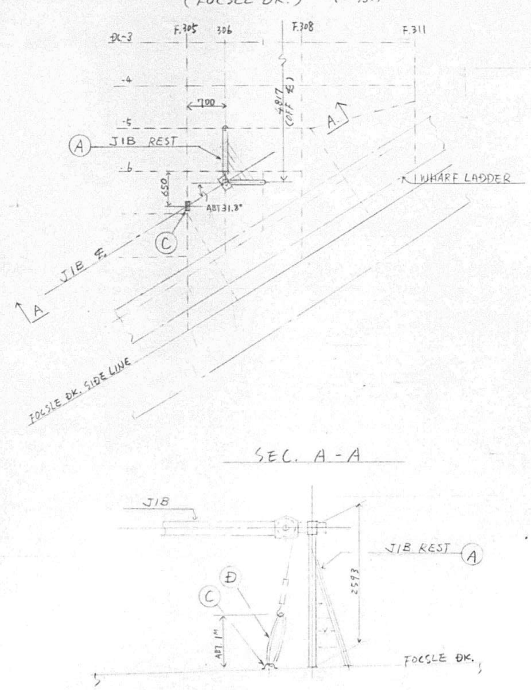
GENERAL NOTE

1. SEE OTHER PLAN: DWG NO. 4101232 BOATSWAIN'S STORE AND ENGINE ROOM CRANE.

DWG.NO. 4101233 — 3/9

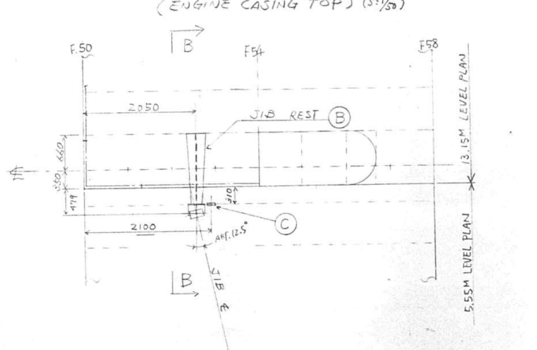
4/9

ARRANGEMENT
(FOCSLE DK.) (S=1/50)

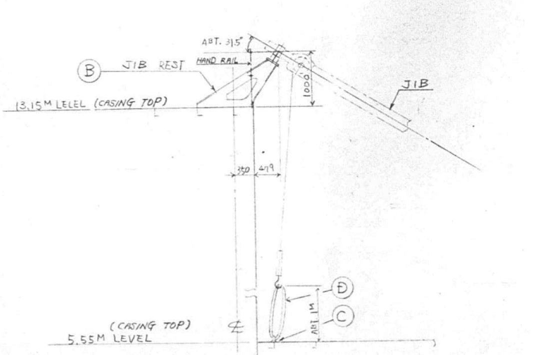


5/9

ARRANGEMENT
(ENGINE CASING TOP) (S=1/50)

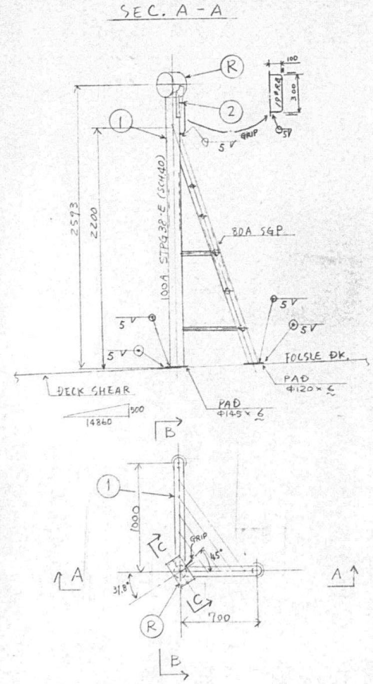


SEC. B-B

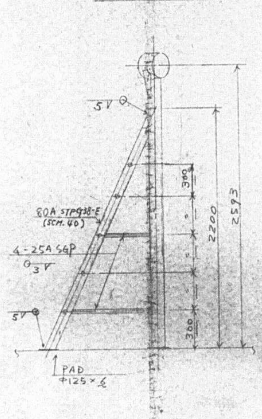


6/9

SEC. A-A

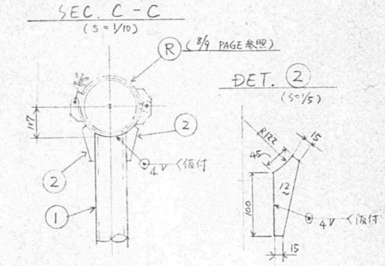


SEC. B-B



SEC. C-C
(S=1/10)

DET. (2)
(S=1/5)



(WORKING NOTE.)

1. 符号 (R), (2) は仮付で納入, JIB 格納状況チェックの上本付のこと
2. PADは仮付で納入のこと.
3. DECK SHEAR 考慮の上製作のこと
4. 本体は垂直に取付けのこと

T.W. = 105.9 Kg

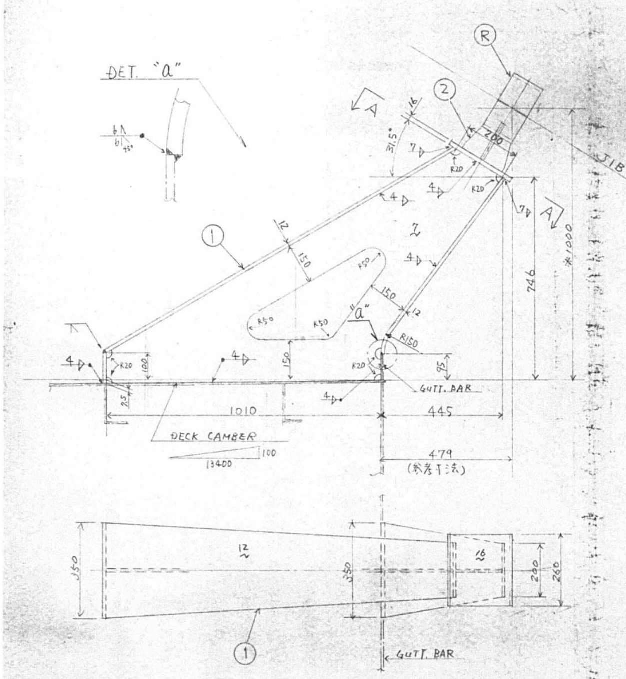
符号 NO.	名称 NAME	材料 MATERIAL	試験片 TEST PIECE	常備 USE	予備 SPARE	合計 TOTAL	関係工場 WORK SHOP	1個 ONE 重量(kg) WEIGHT	合計 TOTAL 重量(kg) WEIGHT	記事 REMARKS
R	HEAD PIECE	——				1	(M) (廿)		11.3	SEE PAGE 8/9 8/9 PAGE参照
2	BRACKET	SS41				2	↕	0.4	0.8	
1	REST STANCHION	STPG38-E SS41				1 SET	(M) (廿)			

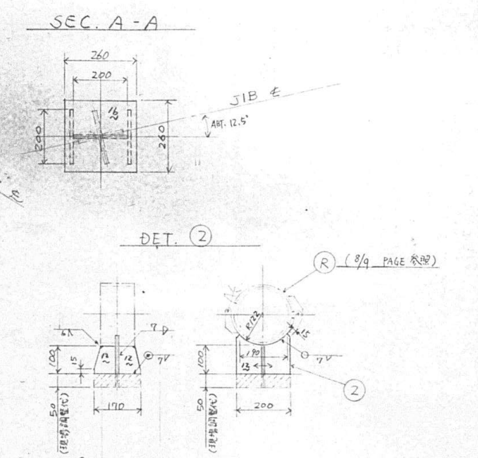
製造個数は 1 SET 分を示す　1 SET (1隻分)　3 隻分製造のこと。

(A) JIB REST　尺度 SCALE 1/25

905

7/9





WORKING NOTE.

1. 符号②は現場調整代を含めて製作し, CRANE 搭載状況チェックの上現場調整後取付けのこと.

T.W = 113.8 kg

符号 NO	名称 NAME	材料 MATERIAL	試験片 TEST PIECE	常備 USE	予備 SPARE	合計 TOTAL	関係工場 WORK SHOP	1個 ONE	合計 TOTAL	記事 REMARKS
R	HEAD PIECE	——				1	ⓜ ㋝		11.3	SEE PAGE 8/9 8/9 ページ参照
2	SUPPORT	SS41				1	↕		3.5	
1	BASE	SS41				1	ⓜ ㋝		99.0	

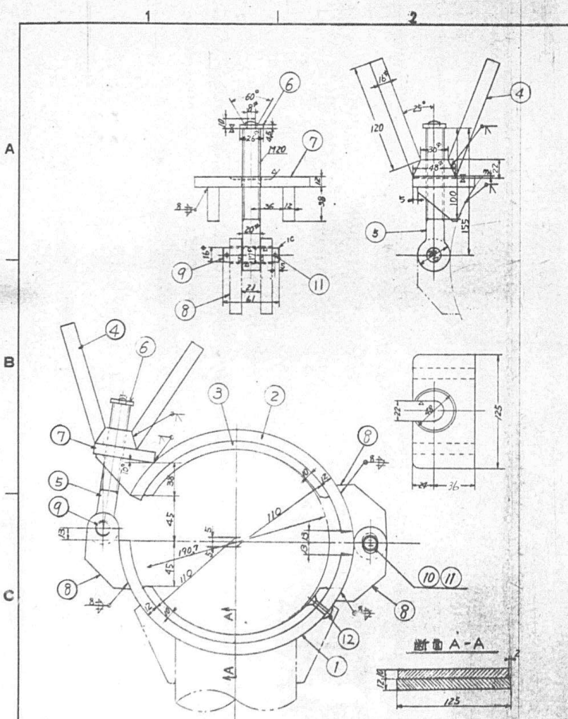
製造個数は 1SET 分を示す　1SET (1隻分)　3 隻分製造のこと。

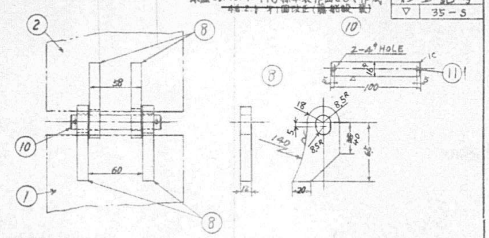
Ⓑ JIB REST　尺度 SCALE 1/10

8/9

WORKING NOTE　仕上記号 ▽ 35-S

~~未記載は MS 標準製作図として作成~~





WORKING NOTE

注 1. ライナは接着剤およびさら鋲により取付けのこと。
2. 下記製造個数は1組分を示す

~~ISO ねじ~~

重量合計 TOTAL WEIGHT 11.30 kg (除ライナ)

符号 No.	名称 NAME	材料 MATERIAL	試験片 TEST PIECE	常備 USE	予備 SPARE	合計 TOTAL	関係工場 WORK SHOP	1個 ONE	合計 TOTAL	記事 REMARKS
12	鋲 RIVET	銅 鋲 COPPER		8		8	↑			6φ x 30
11	割ピン SPLIT PIN	黄銅線 BRASS		4		4				4φ L=25 JIS 1351
10	ピン PIN	黄銅 BRASS		1		1				
9	ピン PIN	棒鋼 STEEL		1		1				
8	ヒンジプレート HINGE PLATE	鋼板 STEEL		6		6				
7	締付座 TONGUE	鋼板 STEEL		1		1				
6	ナットとめ NUT STOPPER	鋼板 STEEL		1		1				
5	締付ボルト BOLT	黄銅棒 BRASS		1		1				
4	ちょう形ナット BUTTERFLY NUT	棒鋼 STEEL		1		1				
3	ライナ LINER	ネオプレーン NEOPREN		2		2		0.71		
2	押え帯 PRESS BAND	鋼板 STEEL		1		1				
1	受帯 RECEIVE BAND	鋼板 STEEL		1		1	ⓜ ㋝			

SHIP DESIGN DEPARTMENT　工事番号　工事区分

MES SD標準製作図

SEC. CHIEF
ASSIST. CHIEF
CHARGE ENG'R
STAFF
DRAWER
DATE

Ⓡ HEAD PIECE

試験力　TEST　SCALE 1/3

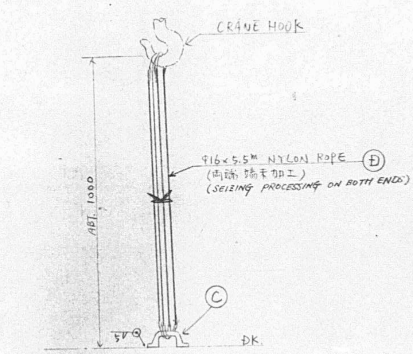
CLASSIFICATION NO. JIS F 2205-'67

DRAWING NO. SD 41274-03205①

MITSUI SHIPBUILDING & ENGINEERING CO., LTD.

906

DETAIL OF LASHING



符号 NO.	名称 NAME	材料 MATERIAL	試験片 TEST PIECE	常備 USE	予備 SPARE	合計 TOTAL	関係工場 WORK SHOP	1個 ONE	合計 TOTAL	記事 REMARKS
(D)	LASHING ROPE	NYLON				2	(ッ) (ｲ)		-	⌀16
(C)	EYE	SS41				2	(ッ) (ｲ)		0.5	JIS F 3410 E-0.5

製造個数は 1 隻分を示す ~~(1隻分)~~ 3 隻分製造のこと。

(C) EYE , (D) LASHING ROPE

尺度 SCALE ～

TSO. DR. NO. PAGE

61131-382-I.A4.ト 200.48.1.TH

ALT.NO.	OWNER DATE	OWNER LETTER NO.	USCG DATE	USCG LETTER NO.	ABS DATE	ABS LETTER NO.	USPH DATE	USPH LETTER NO.
ORIGINAL	July 5.85	OFTS/LKS-669						
REV.-1	Mar. 11.86	TAN/156						

APPROVAL OF OWNER & REGULATORY BODIES

FINISHEDPLAN

SHIPYARD AND SHIP'S NO. & NAME

MITSUI TAMANO		MITSUBISHI KOBE	
NO.1323	DOCTOR LYKES	NO.1158	JAMES LYKES
NO.1324	ALMERIA LYKES	NO.1159	JOSEPH LYKES
NO.1325	TILLIE LYKES	NO.1164	SOLON TURMAN

MITSUI ENGINEERING & SHIPBUILDING CO.,LTD.
TAMANO WORKS

SHIP DESIGN DEPARTMENT MANAGER — SHIP'S NO. **NO.1325** — SHIP'S NAME **TILLIE LYKES**

OUTFITTING DESIGN SECTION

レーダーマスト装置
ARR. OF RADAR MAST

DATE (TEL 2235)
JOB NO. TS1323/24/25
JOBCLASSIF. NO. D. 20.05
(5 SHEETS WITH COVER)

LYKES REF. NO. 170201 — MITSUI DRAWING NO. 4120535 — REV. R

1/5

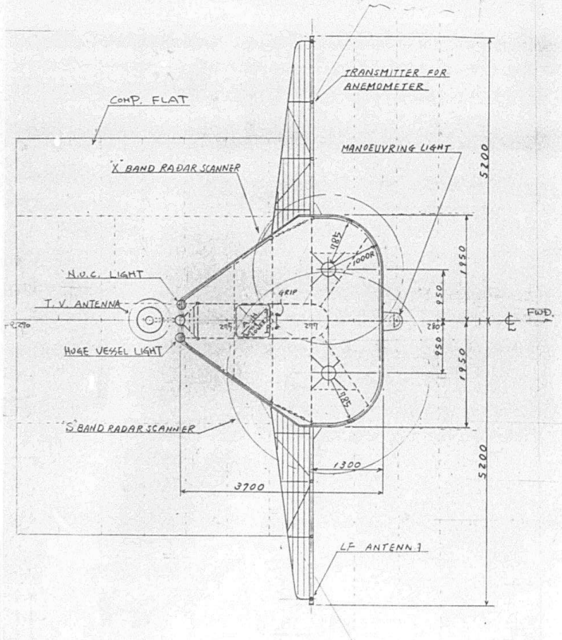
PLAN RECORD

ALT. NO.	MARK	ALTERATION/DESCRIPTION	DATE & SIGNATURE
1		PREPARED FOR S.NO.1323 AS FINISHED PLAN, CHANGED AS FOLLOW. △······· ADDED THE HOOP FOR LIGHT POST. MADE APPLICABLE TO S.NO.1324 AND S.NO.1325.	NOVEMBER. 26.86

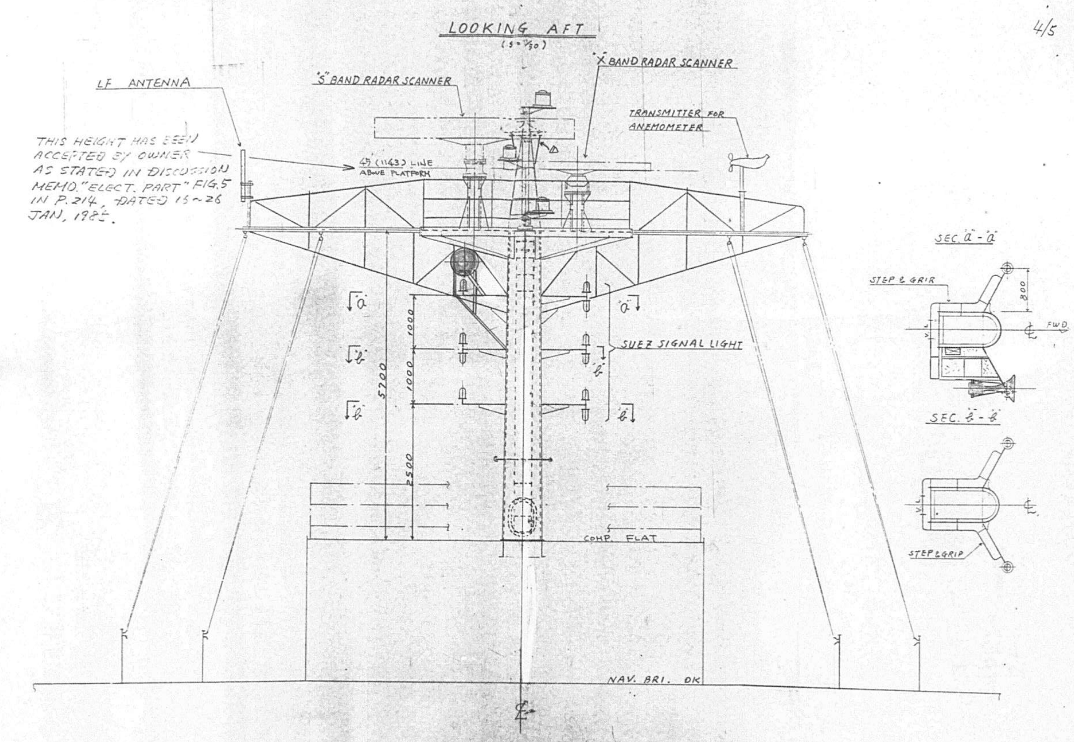
DWG.NO. 4120535

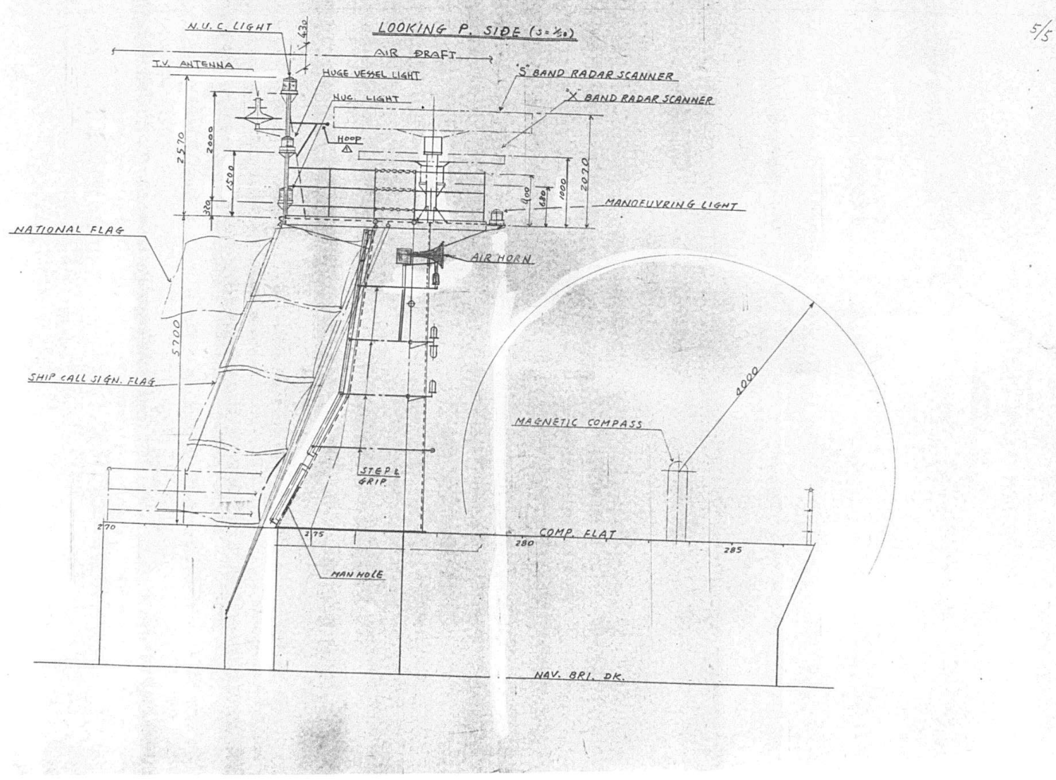
3/5

PLAN (S=1/30)



REF. DWG.
6120021 : ARR OF NAV. LIGHT & SIGNAL LIGHT


LOOKING AFT (S=1/50)
4/5
LF ANTENNA
"S" BAND RADAR SCANNER
"X" BAND RADAR SCANNER
TRANSMITTER FOR ANEMOMETER
THIS HEIGHT HAS BEEN ACCEPTED BY OWNER AS STATED IN DISCUSSION MEMO."ELECT. PART" FIG.5 IN P.214, DATED 13~26 JAN, 1982.
SUEZ SIGNAL LIGHT
5200
1000
1000
2500
COMP. FLAT
NAV. BRI. DK
SEC. "a"-"a"
STEP & GRIP
800
FWD
SEC. "b"-"b"
STEP & GRIP


LOOKING P. SIDE (S=1/50)
5/5
N.U.C. LIGHT
630
AIR DRAFT
T.V. ANTENNA
HUGE VESSEL LIGHT
NUC. LIGHT
HOOP
"S" BAND RADAR SCANNER
"X" BAND RADAR SCANNER
2570
2000
1500
320
2020
1000
400
MANOEUVRING LIGHT
NATIONAL FLAG
AIR HORN
5700
SHIP CALL SIGN. FLAG
4000
MAGNETIC COMPASS
STEP & GRIP
270
275
280
285
COMP. FLAT
MAN HOLE
NAV. BRI. DK.

1/4

ALT. NO.	OWNER DATE	OWNER LETTER NO.	USCG DATE	USCG LETTER NO.	ABS DATE	ABS LETTER NO.	USPH DATE	USPH LETTER NO.
ORIGINAL	July 22 '85	OFTS/MES-0169						
REV. - A	Sep. 26 '85	OFTS/MES-0186						

APPROVAL OF OWNER & REGULATORY BODIES

FINISHEDPLAN

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SHIPYARD AND SHIP'S NO. & NAME			
MITSUI TAMANO		MITSUBISHI KOBE	
NO.1323	DOCTOR LYKES	NO.1158	JAMES LYKES
NO.1324	ALMERIA LYKES	NO.1159	JOSEPH LYKES
NO.1325	TILLIE LYKES	NO.1164	SOLON TURMAN

MITSUI ENGINEERING & SHIPBUILDING CO., LTD.
TAMANO WORKS

SHIP DESIGN DEPARTMENT MANAGER — SHIP'S NO. **NO.1325** — SHIP'S NAME **TILLIE LYKES**

OUTFITTING DESIGN SECTION

アフトマスト装置
ARR. OF AFT MAST

DATE (TEL 2225)

JOB NO. TS1323/24/25 — SCALE 1/50 — LYKES REF. NO. 170202 — MITSUI DRAWING NO. 4120536

JOB CLASSIF. NO. D.20.05

(4 SHEETS WITH COVER)

A2×1 A4×3

3/4

PLAN RECORD

ALT. NO.	MARK	ALTERATION/DESCRIPTION	DATE & SIGNATURE
1		PREPARED FOR S.NO.1323 AS FINISHED PLAN, MADE APPLICABLE TO S.NO.1324 AND S.NO.1325.	NOVEMBER 20, 86

DWG. NO. 4120536

3/4

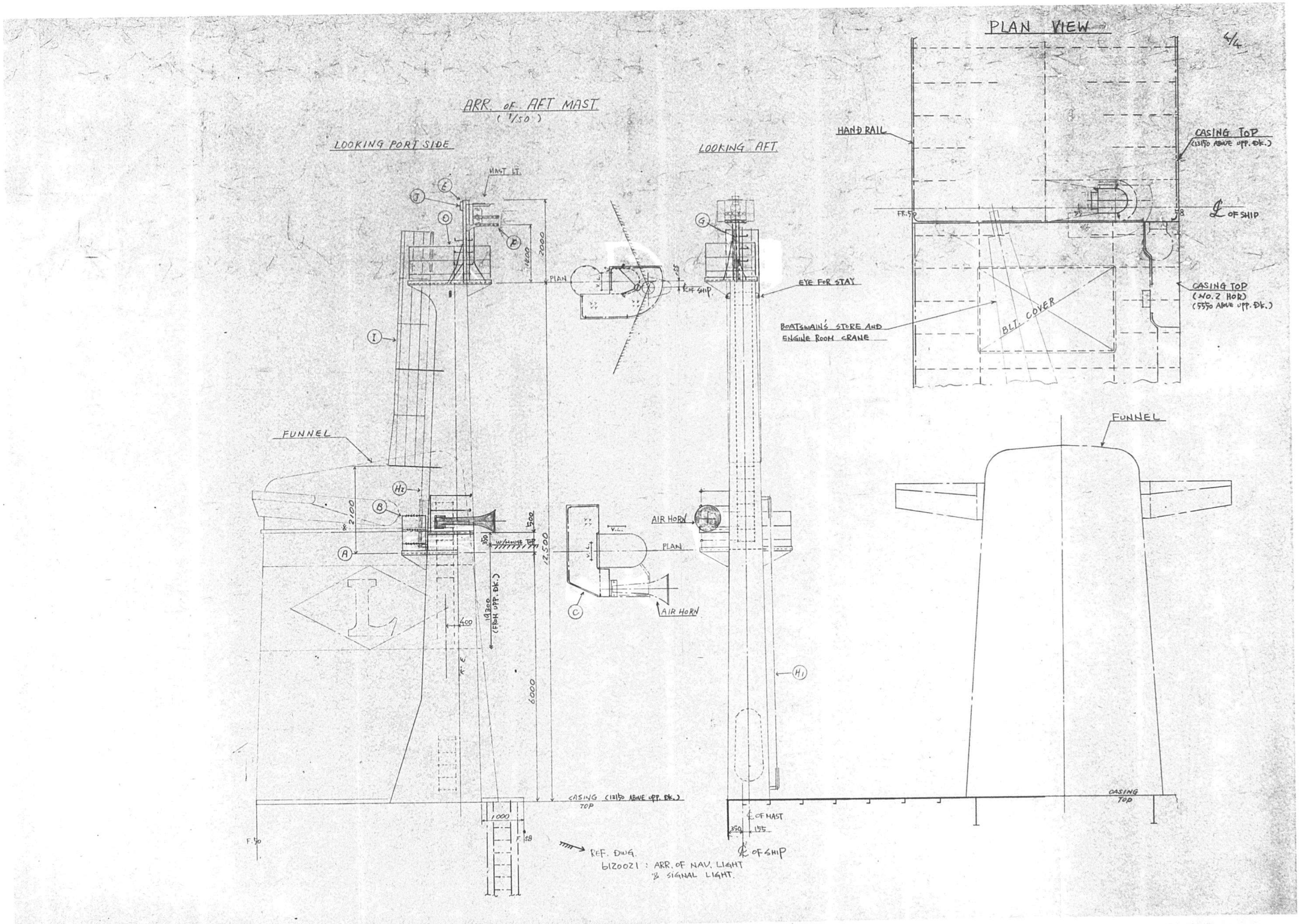
符号 NO.	名称 NAME	材料 MATERIAL	常備 USE	予備 SPARE	合計 TOTAL	関係工場 WORK SHOP	重量 WEIGHT	記事 REMARKS
J	HAND GRIP	SS41 MILD STEEL			1	↑		PROVIDED ACC. TO USCG 46-5108.160
I	CAGE	SS41 MILD STEEL			SET 1			
H2	VERTICAL LADDER				SET 1			
H1	VERTICAL LADDER				SET			
G	STEP				6			
F	MAST LT. SEAT	SS41 MILD STEEL			SET 1			
E	TOP MAST BODY	S.T.P.G. MILD STEEL			SET 1			
D	MAST TOP STAGE HAND RAIL	S.G.P. MILD STEEL			SET 1			
C	AIR HORN SEAT	SS41 MILD STEEL			SET 1			
B	LOW. STAGE HAND RAIL	S.G.P. MILD STEEL			SET 1			
A	LOW. STAGE	SS41 MILD STEEL			SET 1			

製造個数は 1組 分を示す 1組 (1隻分) 3 隻分製造のこと。

LIST OF AFT MAST — 尺度 SCALE 1/50

TSO.1323/4/5 — DR. NO. — PAGE 1/2

910



ARR. OF AFT MAST
(1/50)
LOOKING PORT SIDE
LOOKING AFT
PLAN VIEW
MAST LT.
FUNNEL
HAND RAIL
CASING TOP
EYE FOR STAY
BOATSWAIN'S STORE AND ENGINE ROOM CRANE
BLT. COVER
CASING TOP (NO.2 HOR) (5550 ABOVE UPP. DK.)
AIR HORN
PLAN
℄ OF SHIP
℄ OF MAST
REF. DWG. 6120021 : ARR. OF NAV. LIGHT & SIGNAL LIGHT.

911

ALT. NO.	OWNER DATE	OWNER LETTER NO.	USCG DATE	USCG LETTER NO.	ABS DATE	ABS LETTER NO.	USPH DATE	USPH LETTER NO.
ORIGINAL	NOV.13.1985	OFTS/MES-1046						
A	JAN.16.1986	OFTS/MES-1169						

APPROVAL OF OWNER & REGULATORY BODIES

FINISHEDPLAN

SHIPYARD AND SHIP'S NO. & NAME			
MITSUI TAMANO		MITSUBISHI KOBE	
NO.1323	DOCTOR LYKES	NO.1158	JAMES LYKES
NO.1324	ALMERIA LYKES	NO.1159	JOSEPH LYKES
NO.1325	TILLIE LYKES	NO.1164	SOLON TURMAN

MITSUI ENGINEERING & SHIPBUILDING CO., LTD.
TAMANO WORKS

SHIP DESIGN DEPARTMENT
MANAGER
OUTFITTING DESIGN SECTION

SHIP'S NO. **NO.1325** SHIP'S NAME **TILLIE LYKES**

アンテナ・灯具台
ANTENNA POLE & SEAT OF LIGHT

DATE SEP 9, 1985 (TEL 2235)
JOB NO. TS1323/24/25
SCALE 1/200, 1/20
LYKES REF. NO. 170203
MITSUI DRAWING NO. 4120555
(SHEETS WITH COVER) 1/35

A1-1
A3-15
A4-19

PLAN RECORD

ALT. NO.	MARK	ALTERATION/DESCRIPTION	DATE & SIGNATURE
1		PREPARED FOR S.NO.1323 AS FINSHED PLAN, MADE APPLICABLE TO S.NO.1324 AND S.NO.1325.	NOVEMBER 20, 86

DWG. NO. 4120555 2

NOTE:
1. BOTH SIDE TO BE SYMMETRICAL EXCEPT SPECIFIED.
2. WELDING TO BE $\frac{a}{4}V$ or $\frac{\ominus}{4}V$ EXCEPT SPECIALLY MENTIONED.

REF. DWG.
6120021 "ARRG OF NAV LIGHT & SIGNAL LIGHT.
6150051 "ARRG OF ANTENNA.
6150530 RADIO STATION.

符号 NO.	名称 NAME	材料 MATERIAL	数量 QUANTITY	関係工場 WORK SHOP	記事 REMARKS
B-13	PILLAR FOR RADIO ANT.	—	1	[illegible]	DETAIL SEE P.10~20
-12	SEAT FOR UHF ANT.	—	1		
-11	SEAT FOR WATCH KEEP ANT.	—	1		
-10	SEAT FOR D/F SENSE ANT.	—	1		
-9	SEAT FOR D/F LOOP ANT.	—	1		
-8	PILLAR FOR FAX ANT.	—	1		
-7	PILLAR FOR AUX. VHF ANT.	—	1		
-6	PILLAR FOR MAIN VHF ANT.	—	1		
-5	PILLAR FOR INMARSAT ANT.	—	1		
-4	SEAT FOR SSB TX ANT.	—	1		
-3	SEAT FOR RX ANT.	—	1		
-2	SEAT FOR RESERV TX ANT.	—	1		
B-1	SEAT FOR MAIN TX ANT.	—	1	[illegible]	

製造個数は 1 隻 分を示す QUANTITY SHOWS FOR 1 SHIP 上記 (1隻分) 3 隻分製造のこと TO BE MADE FOR 3 SHIP

(B-) LIST OF ANTENNA POLE

TSO.1323/4/5 DR. NO. 4120555 PAGE 3

NOTE:
1. BOTH SIDE TO BE SYMMETRICAL EXCEPT SPECIFIED.
2. WELDING TO BE $\frac{a}{4}V$ OR $\frac{\ominus}{4}V$ EXCEPT SPECIALLY MENTIONED.

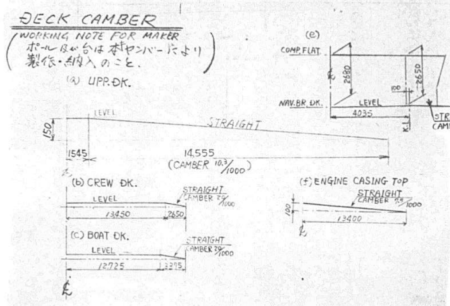
符号 NO.	名称 NAME	材料 MATERIAL	数量 QUANTITY	関係工場 WORK SHOP	記事 REMARKS
A-18	SEAT FOR FLOOD LIGHT	—	2	[illegible]	DETAIL SEE P21~35
A-17	SEAT FOR SIDE LIGHT	—	1	[illegible]	
-16	SEAT FOR SIDE LIGHT	—	1		
-15	SEAT FOR CEILING LIGHT	—	6		
-14	SEAT FOR FLOOD LIGHT	—	1		
-13	"	—	2		
-12	"	—	1		
-11	SEAT FOR FLOOD LIGHT	—	2		
-10	SEAT FOR SUEZ CANAL SIGNAL LT. & ANCHOR LT. & STERN LT.	—	1		
-9	SEAT FOR FLOOD LIGHT	—	1		
-8	SEAT FOR LAMP	—	3		
-7	SEAT FOR FLOOD LIGHT	—	2		
-6	"	—	2		
-5	SEAT FOR FLOOD LIGHT	—	2		
-4	SEAT FOR BOAT LIGHT & LIFE RAFT LIGHT	—	1		
-3	SEAT FOR BOAT LIGHT & LIFE RAFT LIGHT	—	1		
A-2	SEAT FOR FLOOD LIGHT	—	3		
A-1	SEAT FOR FLOOD LIGHT	—	3	[illegible]	

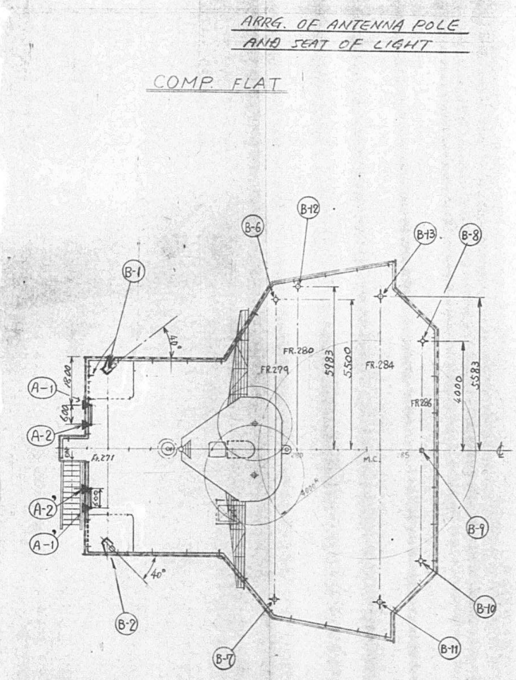
製造個数は 1 隻 分を示す QUANTITY SHOWS FOR 1 SHIP 上記 (1隻分) 3 隻分製造のこと TO BE MADE FOR 3 SHIP

(A-) LIST FOR LIGHT, SEAT

TSO.1323/4/5 DR. NO. 4120555 PAGE 4

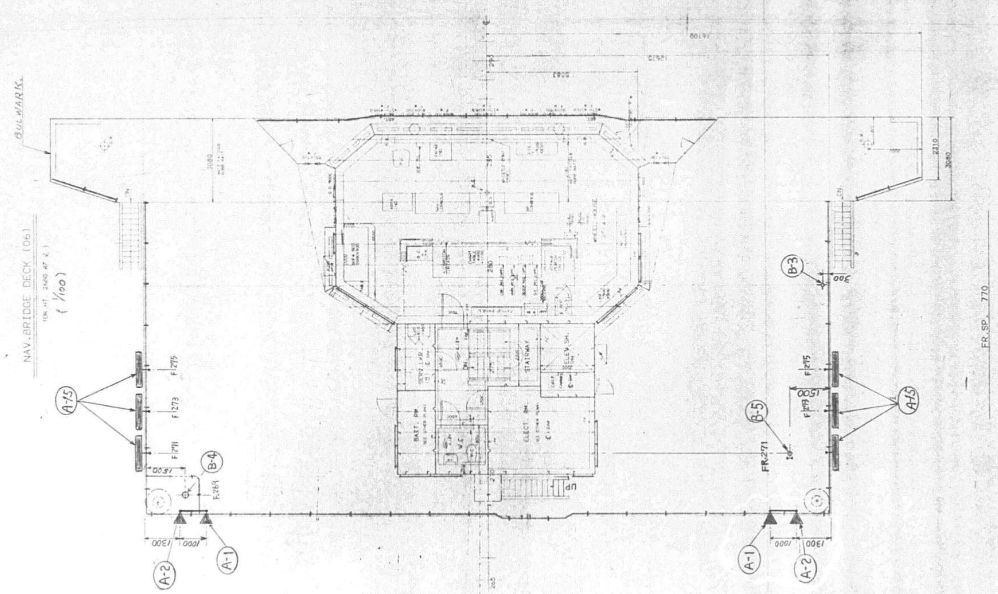
912





5

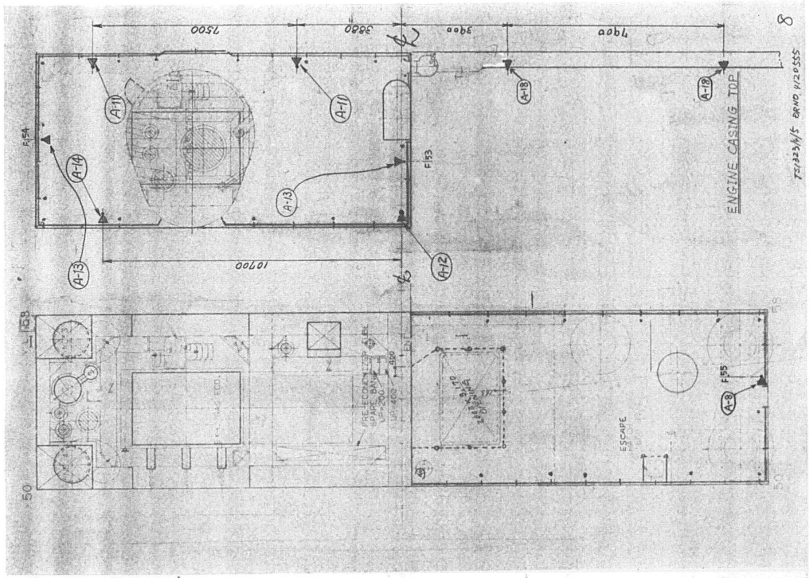
TS1323/6/5 OR NO. 4120555

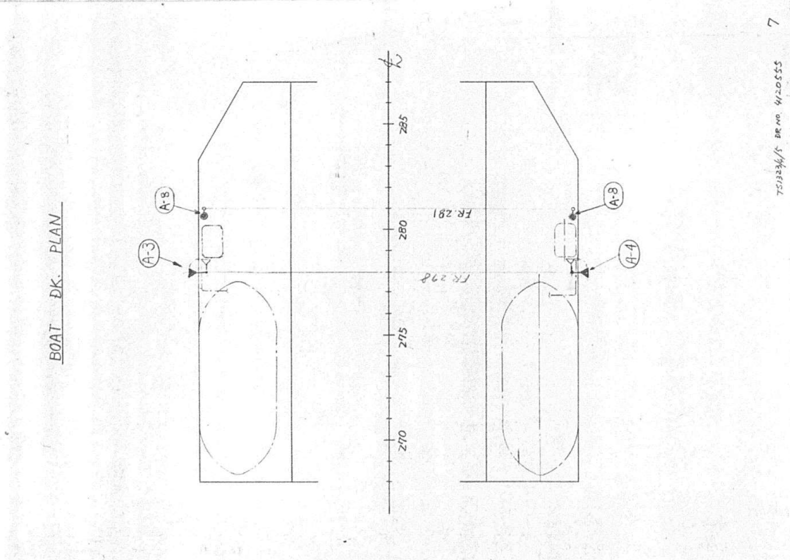


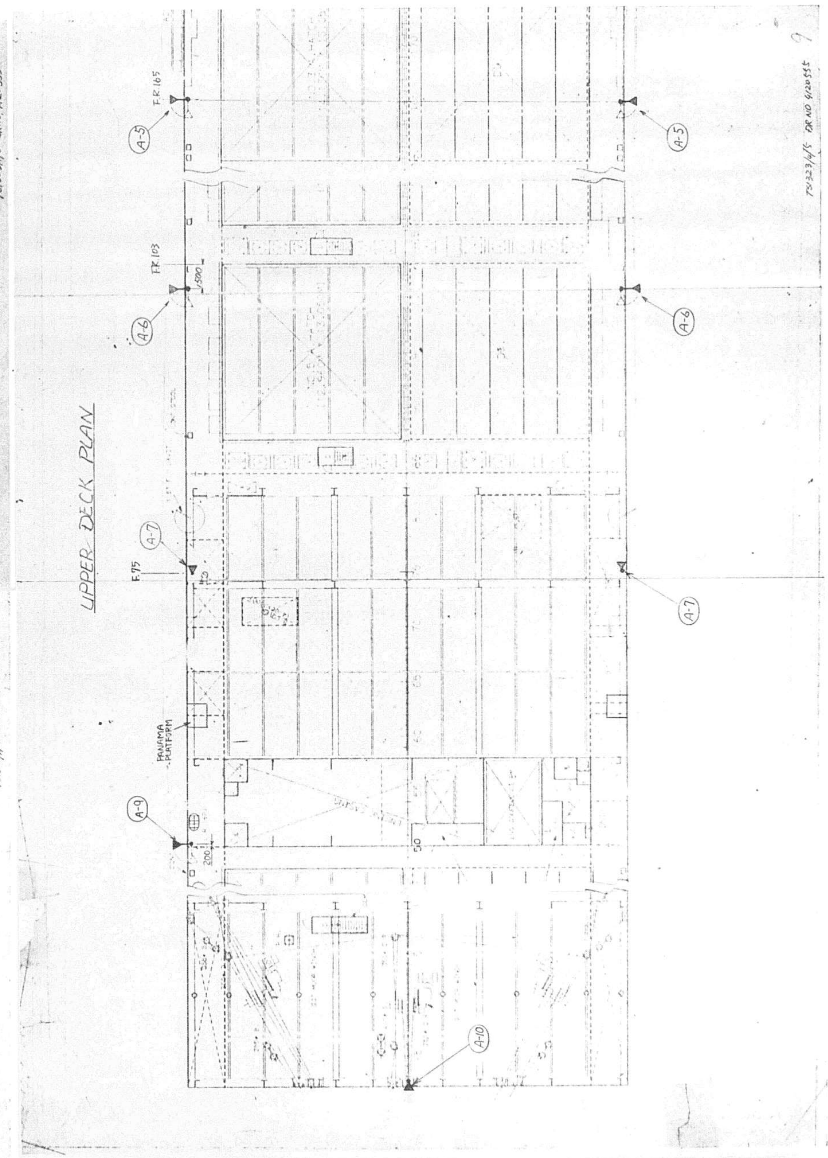
6

TS1323/6/5 OR NO. 4120555

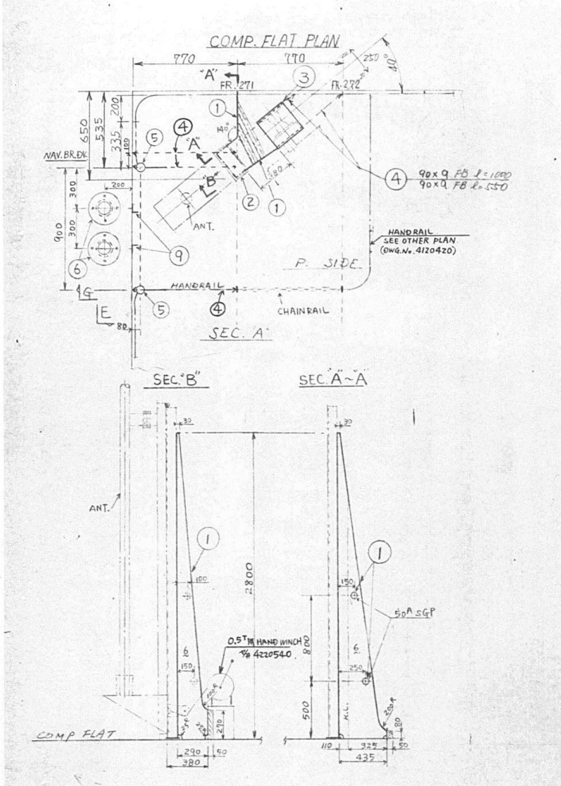
913

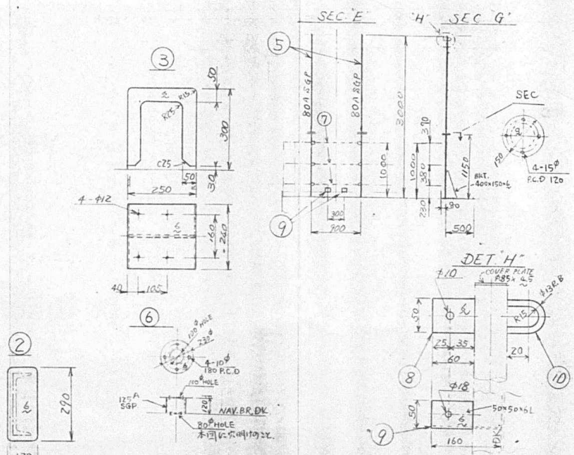

ENGINE CASING TOP
7500
10700
ESCAPE


BOAT DK. PLAN
FR 281
FR 278


UPPER DECK PLAN
PANAMA PLATFORM

914





符号 NO.	名称 NAME	材料 MATERIAL	試験片 TEST PIECE	常備 USE	予備 SPARE	合計 TOTAL	関係工場 WORK SHOP	1個 ONE	合計 TOTAL	記事 REMARKS
10	EYE	SS41				2				GALVD.
9	PIECE	〃				2				GALVD.
8	PIECE	〃				2				GALVD.
7	8φ SHORT LINK CHAIN	SGP SS41				3 SET				WITH SHACKLE, EYE
6	SEAT FOR LEAD-IN INSULATOR	SGP				2				GALV
5	SEAT FOR ANTENNA	SS41				2				SUS 304 BOLT & NUT M14 L:38 S:25 8SET 含む
4	CARLING	〃				5				90×9 F.B ℓ=1000×1 ℓ=550×1 ℓ=800×3
3	SEAT FOR WINCH	〃				1				
2	PAD	SS41				1				GALVD.
1	ANT. SUPPORT	SS41 SGP				1 SET				50A, 6R

(B-1 ONLY: items 5–10)

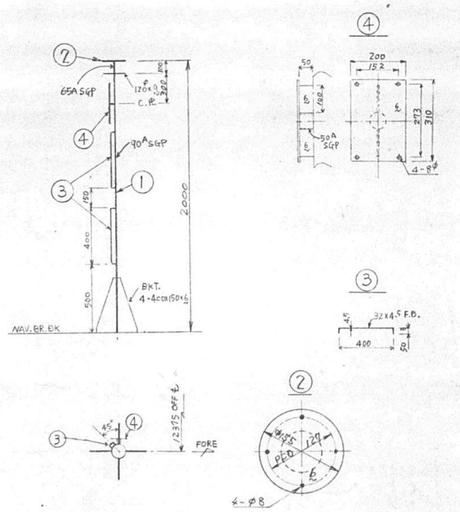
製造個数は 1組 分を示す

B-1 SEAT FOR MAIN TX ANTENNA P. SIDE
B-2 SEAT FOR RESERV TX ANTENNA S. SIDE (対称物)

尺度 SCALE

TS 1323/4/5 DR. NO. 4120555 PAGE 10

61131-3級-工.A4.ト 200.48.1.TH



符号 NO.	名称 NAME	材料 MATERIAL	試験片 TEST PIECE	常備 USE	予備 SPARE	合計 TOTAL	関係工場 WORK SHOP	1個 ONE	合計 TOTAL	記事 REMARKS
4	SEAT FOR LIGHTNING ARRESTOR	SGP SS41				1				GALVD.
3	FITT. FOR ELECTRIC CABLE	SS41				2				GALVD.
2	SEAT	SS41				1				GALVD.
1	POLE	SGP				1 SET				90A, 65A

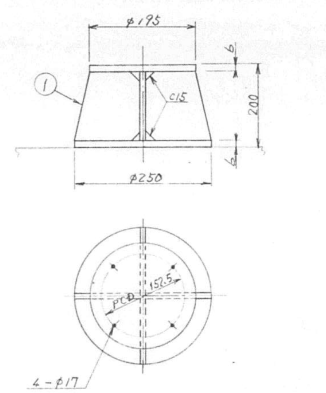
製造個数は 1組 分を示す ~~(1隻分)~~ ~~隻分製造のこと。~~

B-3 SEAT FOR RX ANTENNA

尺度 SCALE

TSO. 1323/4/5 DR. NO. 4120555 PAGE 11

61131-3級-工.A4.ト 200.48.1.TH



符号 NO.	名称 NAME	材料 MATERIAL	試験片 TEST PIECE	常備 USE	予備 SPARE	合計 TOTAL	関係工場 WORK SHOP	1個 ONE	合計 TOTAL	記事 REMARKS
1	SEAT	SS 41				1 SET				GALVD.

製造個数は 1組 分を示す ~~(1隻分)~~ ~~隻分製造のこと。~~

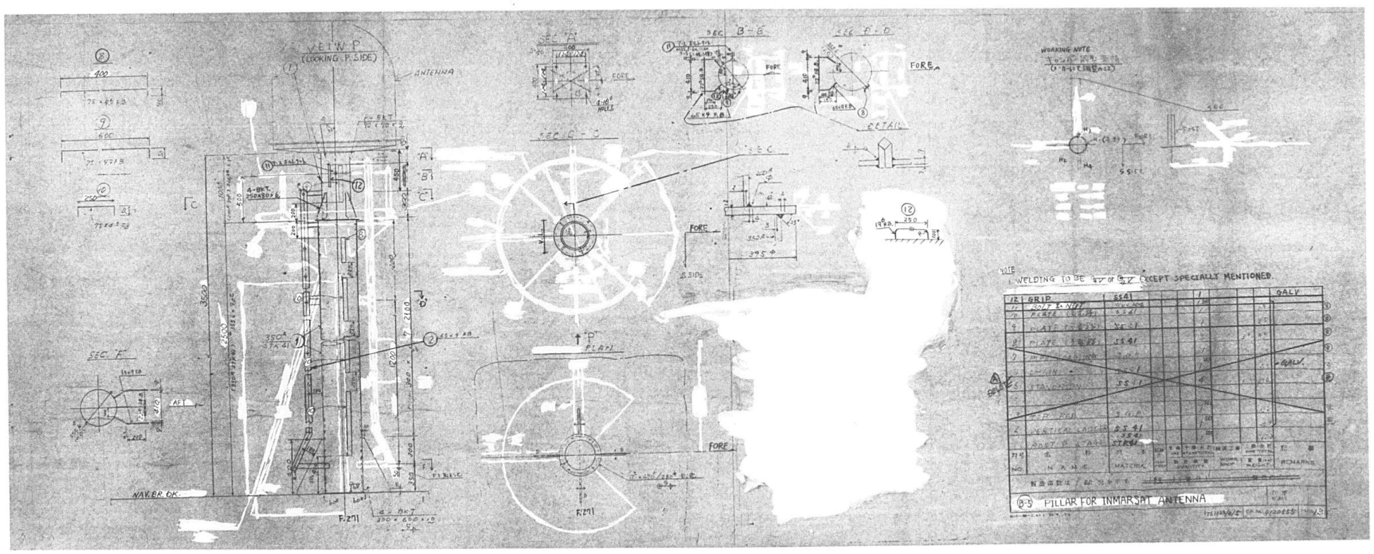
B-4 SEAT FOR SSB TX ANTENNA

尺度 SCALE

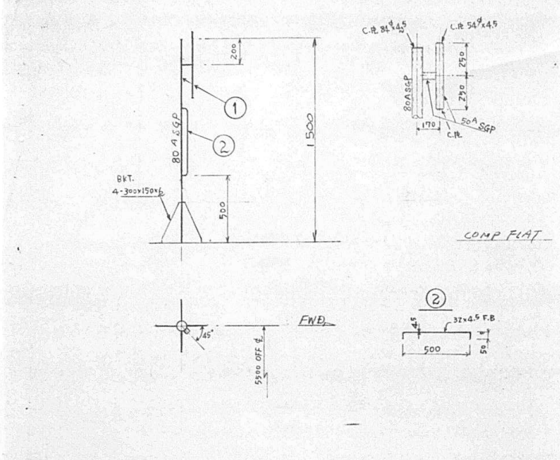
TSO. 1323/4/5 DR. NO. 4120555 PAGE 12

61131-3級-工.A4.ト 200.48.1.TH

915


VIEW P
(LOOKING P. SIDE)
ANTENNA
SEC. B-B
SEC. D-D
FORE
SEC. C-C
SEC. E
DETAIL
WELDING TO BE ... EXCEPT SPECIALLY MENTIONED.
PILLAR FOR INMARSAT ANTENNA
NAV. BR. DK.
F.271

916

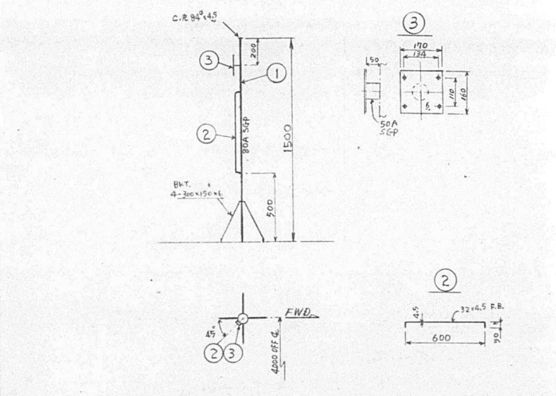


符号 NO.	名称 NAME	材料 MATERIAL	試験片 TEST PIECE	常備 USE	予備 SPARE	合計 TOTAL	関係工場 WORK SHOP	1個 ONE	合計 TOTAL	記事 REMARKS
2	FITT. FOR ELECTRIC CABLE	SS41				1				〃
1	PILLAR	SGP				1 SET				GALV.

製造個数は 1組 分を示す　（1隻分）　隻分製造のこと。

B-9P PILLAR FOR MAIN VHF ANTENNA (本図1個)
B-9C PILLAR FOR AUX. VHF ANTENNA (対称1個)
尺度 SCALE

TSO. 1323/4/5　DR. NO. 4120555　PAGE 14

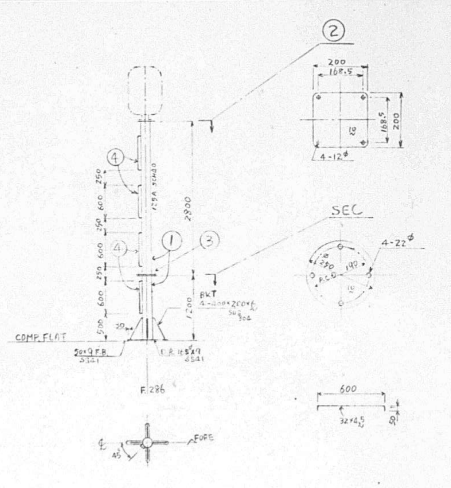


符号 NO.	名称 NAME	材料 MATERIAL	試験片 TEST PIECE	常備 USE	予備 SPARE	合計 TOTAL	関係工場 WORK SHOP	1個 ONE	合計 TOTAL	記事 REMARKS
3	SEAT FOR ANT. JOINT BOX	SGP SS41				1				GALV
2	FITT. FOR ELECTRIC CABLE	SS41				1				GALV
1	PILLAR	SGP				1 SET				GALV

製造個数は 1組 分を示す　（1隻分）　隻分製造のこと。

B-8 PILLAR FOR FAX ANTENNA
尺度 SCALE

TSO. 1323/4/5　DR. NO. 4120555　PAGE 15



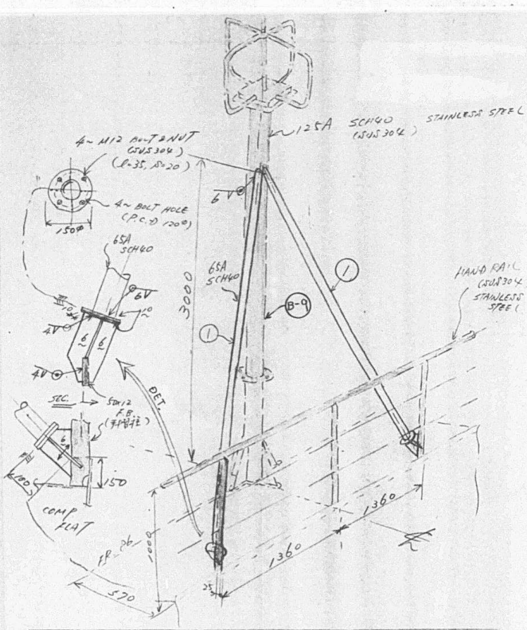
NOTE　WELDING TO BE "SP" OR "SD"

符号 NO.	名称 NAME	材料 MATERIAL	試験片 TEST PIECE	常備 USE	予備 SPARE	合計 TOTAL	関係工場 WORK SHOP	1個 ONE	合計 TOTAL	記事 REMARKS
4	FITT. FOR ELECTRIC CABLE	SUS304				4				
3	BOLT & NUT	SUS304				4				M20 L:45 S:30
2	SEAT	SUS304				1				
1	PILLAR	SUS304				1 SET				D.R.C.S.E.(SS41) 125A SCH40

製造個数は 1組 分を示す　（1隻分）　隻分製造のこと。

B-9 SEAT FOR D/F LOOP ANTENNA
尺度 SCALE

TSO.　DR. NO.　PAGE



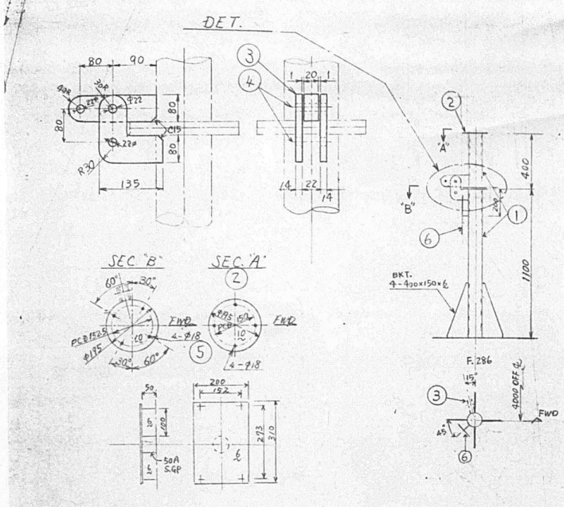
符号 NO.	名称 NAME	材料 MATERIAL	試験片 TEST PIECE	常備 USE	予備 SPARE	合計 TOTAL	関係工場 WORK SHOP	1個 ONE	合計 TOTAL	記事 REMARKS
1	STAY	NON 304 STAINLESS ST.				2				

製造個数は 1組 分を示す

ADD. STAY OF B-9 D/F LOOP ANTENNA POLE
尺度 SCALE

TSO. 1323/4/5　DR. NO. 4120555　PAGE 16

917

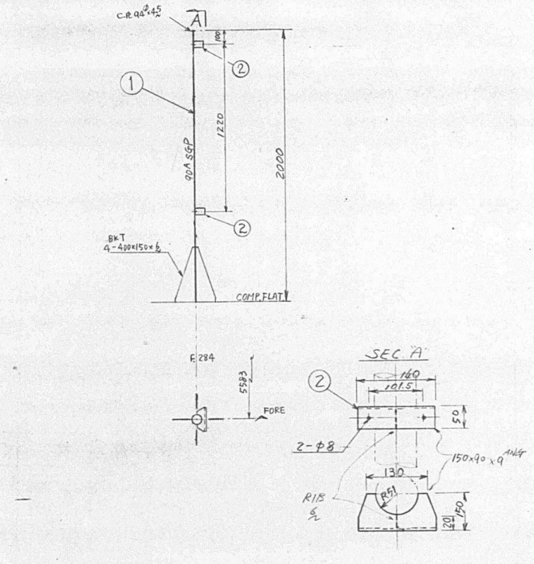


符号 NO.	名称 NAME	材料 MATERIAL	試験片 TEST PIECE	常備 USE	予備 SPARE	合計 TOTAL	関係工場 WORK SHOP	1個 ONE	合計 TOTAL	記事 REMARKS
6	SEAT FOR LIGHTNING ARRESTOR	SGP SS41				1				GALV
5	BOLT & NUT	SUS 304				4				M16 ℓ=45 S=30
4	BOLT & NUT	SUS 304				2				M20 ℓ=75 S=28
3	HING	SS41				1				
2	SEAT	SS41				1				GALV.
1	PILLAR	STPG38				1 SET				100A SCH80

製造個数は 1組 分を示す (1隻分) 隻分製造のこと。

B-10 SEAT FOR D/F SENSE ANTENNA 尺度 SCALE

TSO.1323/4/5 DR. NO. 4120555 PAGE 17

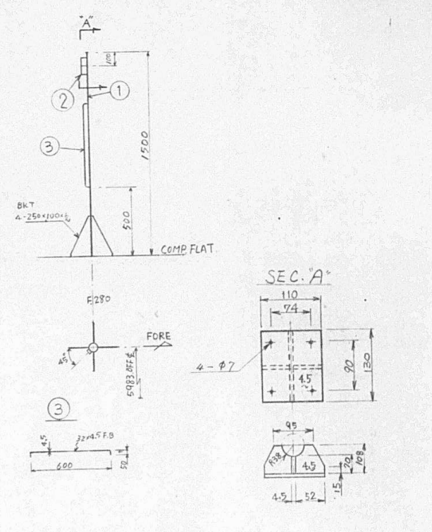


符号 NO.	名称 NAME	材料 MATERIAL	試験片 TEST PIECE	常備 USE	予備 SPARE	合計 TOTAL	関係工場 WORK SHOP	1個 ONE	合計 TOTAL	記事 REMARKS
2	SEAT	SS41				2				GALV.
1	PILLAR	SGP				1 SET				

製造個数は 1組 分を示す (1隻分) 隻分製造のこと。

B-11 SEAT FOR WATCH KEEP ANTENNA 尺度 SCALE

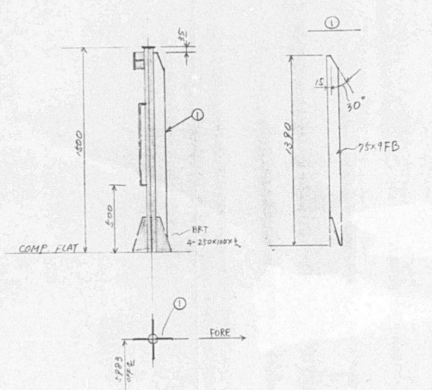
TSO.1323/4/5 DR. NO. 4120555 PAGE 18



符号 NO.	名称 NAME	材料 MATERIAL	試験片 TEST PIECE	常備 USE	予備 SPARE	合計 TOTAL	関係工場 WORK SHOP	1個 ONE	合計 TOTAL	記事 REMARKS
3	FITT. FOR ELECTRIC CABLE	SS41				1				GALV.
2	SEAT	SS41				1				
1	PILLAR	SGP				1 SET				65A

製造個数は 1組 分を示す

B-12 SEAT FOR UHF ANTENNA 尺度 SCALE



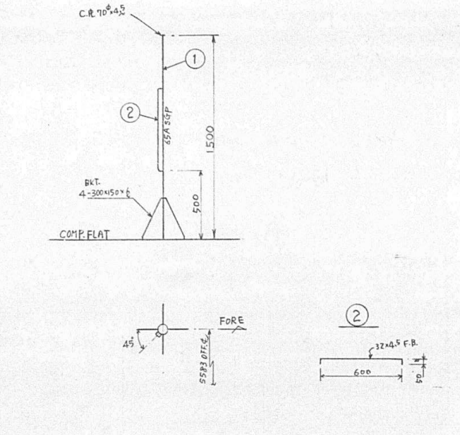
符号 NO.	名称 NAME	材料 MATERIAL	試験片 TEST PIECE	常備 USE	予備 SPARE	合計 TOTAL	関係工場 WORK SHOP	1個 ONE	合計 TOTAL	記事 REMARKS
1	ADDITIONAL PLATE	SS00				1				75×9FB GALV.

製造個数は 1組 分を示す

ADD SUPPORT (B-12) UHF ANTENNA 尺度 SCALE

TSO.1323/4/5 DR. NO. 4120555 PAGE 19

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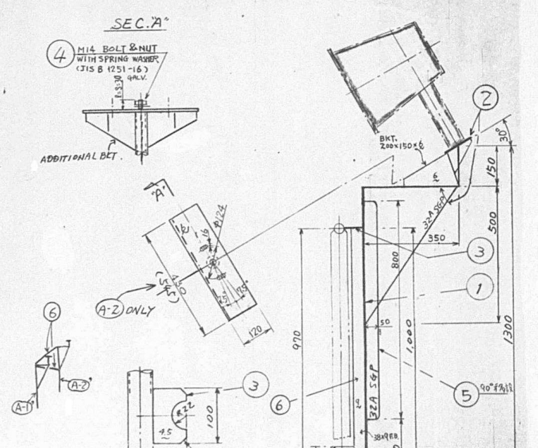


符号 NO.	名称 NAME	材料 MATERIAL	試験片 TEST PIECE	常備 USE	予備 SPARE	合計 TOTAL	関係工場 WORK SHOP	1個 ONE	合計 TOTAL	記事 REMARKS
2	FITT. FOR ELECTRIC CABLE	SS41		1						"
1	PILLAR	SS41 SGP		1 SET						GALV.

製造個数は 1組 分を示す　~~(1隻分)　隻分製造のこと。~~

B-13 PILLAR FOR RADIO ANTENNA　尺度 SCALE

TSO. 1323/4/5　DR. NO. 4120255　PAGE 20

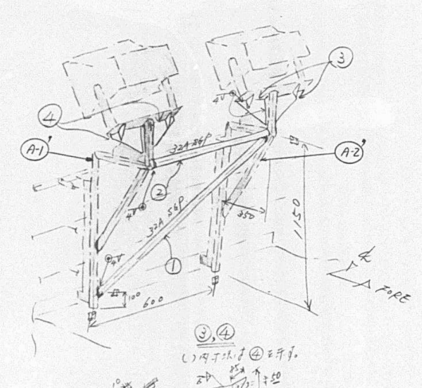


NOTE; WELDING TO BE

符号 NO.	名称 NAME	材料 MATERIAL	試験片 TEST PIECE	常備 USE	予備 SPARE	合計 TOTAL	関係工場 WORK SHOP	1個 ONE	合計 TOTAL	記事 REMARKS
6	SUPPORT	SS41, SGP		1 SET		1 SET				32ASGP ℓ=2000
5	FITTING FOR ELECTRIC CIRCUIT	SS41 MILD STEEL		1		1				32×4.5FB ℓ=800
4	BOLT & NUT	"		1		1			0.22	
3	BRACKET	"		1		1				GALVD
2	SEAT	SS41 MILD STEEL		1		1			2.5	
1	POLE	SGP STEEL PIPE		1		1			3.8	

製造個数は 1組 分を示す

A-1 A-2 SEAT FOR FLOOD LIGHT　尺度 SCALE 1/10

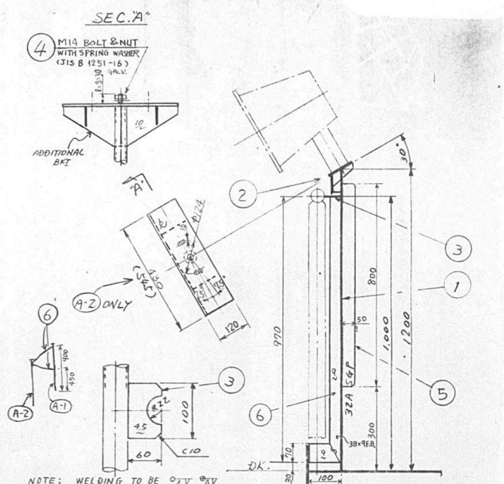


符号 NO.	名称 NAME	材料 MATERIAL	試験片 TEST PIECE	常備 USE	予備 SPARE	合計 TOTAL	関係工場 WORK SHOP	1個 ONE	合計 TOTAL	記事 REMARKS
4	ADDITIONAL BRACKET	SS400				2				[illegible]
3	ADDITIONAL BRACKET	SS400				2	"			[illegible]
2	SUPPORT	SGP				1	"			
1	SUPPORT	SGP				1				

製造個数は　分を示す

ADD. SUPPORT AND BRACKET OF A-1 A-2 FLOOD LIGHT　尺度 SCALE

TS 1324/5　DR. NO. 4120255　PAGE 21

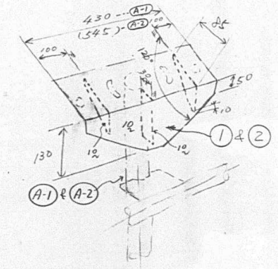


NOTE: WELDING TO BE ^{0}4V, ^{0}4V

符号 NO.	名称 NAME	材料 MATERIAL	試験片 TEST PIECE	常備 USE	予備 SPARE	合計 TOTAL	関係工場 WORK SHOP	1個 ONE	合計 TOTAL	記事 REMARKS
6	SUPPORT	SS41 SGP		1		1				32A SGP ℓ=3000
5	FITTING FOR ELECTRIC CIRCUIT	SS41 MILD STEEL		1		1				32×4.5FB ℓ=800
4	BOLT & NUT	〃		1		1				
3	BRACKET	〃		1		1			2.22	GALVD
2	SEAT	SS41 MILD STEEL		1		1			2.5	
1	POLE	SGP STEEL PIPE		1		1			3.8	

製造個数は 1組 分を示す

(A-1)(A-2) SEAT FOR FLOOD LIGHT — 尺度 SCALE 1/10

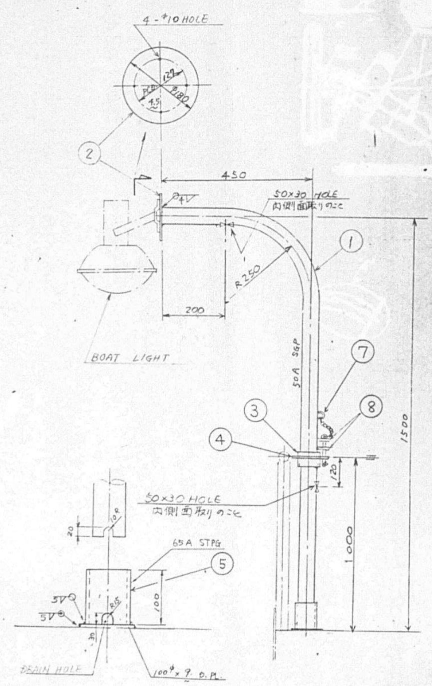


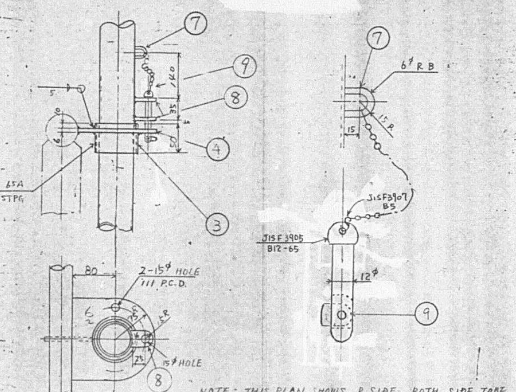
符号 NO.	名称 NAME	材料 MATERIAL	試験片 TEST PIECE	常備 USE	予備 SPARE	合計 TOTAL	関係工場 WORK SHOP	1個 ONE	合計 TOTAL	記事 REMARKS
2	ADDITIONAL BRACKET	SS400				1	[illegible]			(A-2) FLOOD TYPE
1	ADDITIONAL BRACKET	SS400				1	[illegible]			(A-1) FLOOD TYPE

製造個数は 1組 分を示す

ADD. BRACKET OF (A-1), (A-2) FLOOD LIGHT. — 尺度 SCALE

TS [illegible] DR. NO 4120 SSS PAGE 22





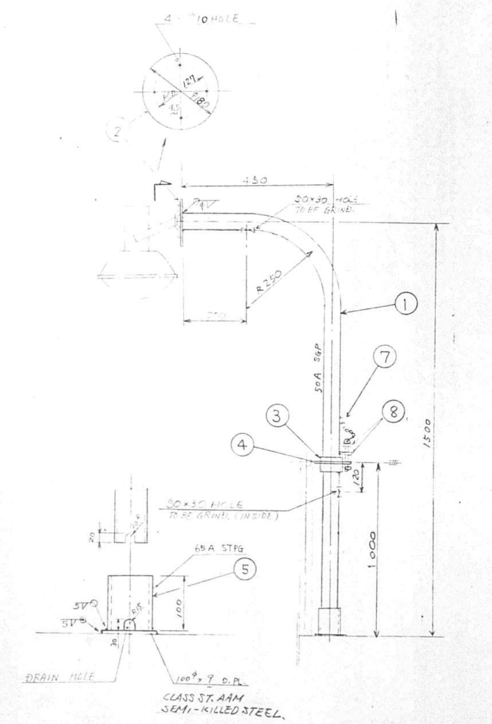
NOTE; THIS PLAN SHOWS P. SIDE, BOTH SIDE TO BE SYMMETRICAL. (A-3) - FOR P. SIDE, (A-4) - FOR S. SIDE)

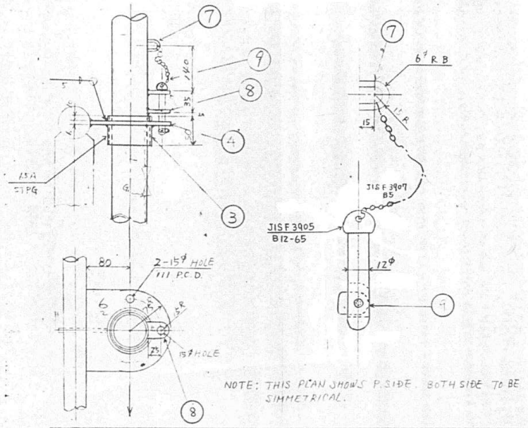
符号 NO.	名称 NAME	材料 MATERIAL	試験片 TEST PIECE	常備 USE	予備 SPARE	合計 TOTAL	関係工場 WORK SHOP	1個 ONE	合計 TOTAL	記事 REMARKS
10	SEAT OF LIFE RAFT LIGHT	SS41 MILD STEEL				1				
9	TOGGLE PIN	SUS 304				1				JIS F 3906 B5 鎖付 ℓ=200
8	EYE	SS41 MILD STEEL				2				
7	EYE	〃				1				
6	NUT	SS41 MILD STEEL				2				M12 [illegible] GALVD
5	LOWER SOCKET	STPG STEEL PIPE				1				SCH 40
4	BRACKET	SS41 MILD STEEL				1				
3	UPPER SOCKET	STPG STEEL PIPE				1				SCH 40
2	SEAT OF BOATLIGHT	SS41 MILD STEEL				1				
1	POLE	SGP STEEL PIPE				1				

製造個数は 1組 分を示す

(A-3)(A-4) SEAT FOR BOAT LIGHT & LIFE RAFT LIGHT — 尺度 SCALE

TS 1523/4/5 DR. NO. 4120SSS PAGE 23





符号 NO.	名称 NAME	材料 MATERIAL	数量 QUANTITY	記事 REMARKS
9	PIN	SUS 304		JIS F 3906 B5
8	EYE	SS41 MILD STEEL	2	
7	EYE	〃	1	
6	NUT	SS41 MILD STEEL	2	
5	LOWER SOCKET	STPG STEEL PIPE	1	SCH 40
4	BRACKET	SS41 MILD STEEL	1	
3	UPPER SOCKET	STPG STEEL PIPE	1	SCH 40
2	SEAT	SS41 MILD STEEL	1	
1	POLE	SGP STEEL PIPE	1	

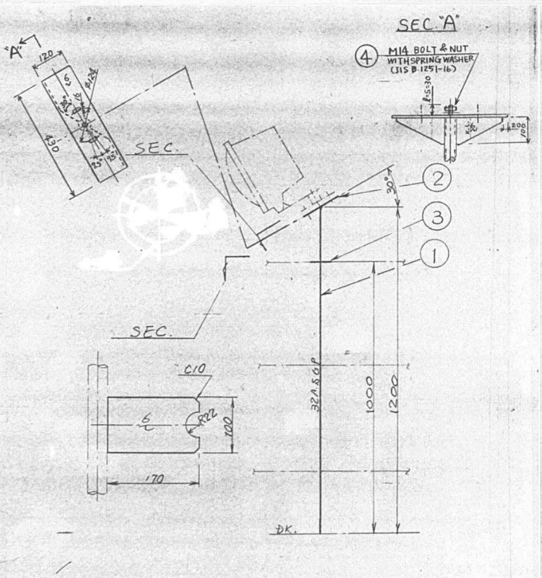
GALV.

製造個数は 1 組 分を示す

A-5 A-6 A-7 SEAT FOR FLOOD LIGHT

尺度 SCALE

TS 1323/4/5 DR. NO. 4120 555 PAGE 24



NOTE: WELDING TO BE ∇4V , ∇4V .

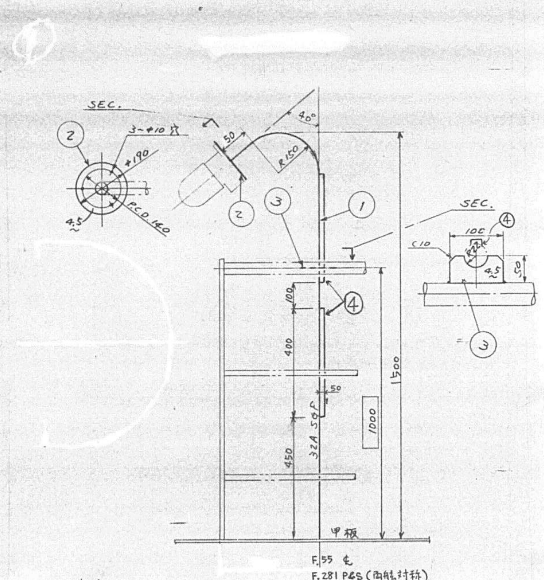
符号 NO.	名称 NAME	材料 MATERIAL	常備 USE	合計 TOTAL	記事 REMARKS
4	BOLT & NUT	〃	1	1	GALVD
3	BRACKET	〃	1	1	GALVD.
2	SEAT	SS41 MILD STEEL	1	1	
1	POLE	SGP STEEL PIPE	1	1	

製造個数は 1 組 分を示す

A-7 SEAT FOR FLOOD LIGHT

尺度 SCALE

TS 1323/4/5 DR. NO. 4120 555 PAGE 25



注. 溶接は ∇3V 又は ∇3V とする

合計約 7.0 Kg

符号 NO.	名称 NAME	材料 MATERIAL	常備 USE	合計 TOTAL	1個 ONE	記事 REMARKS
4	FITT. FOR ELECTRIC CABLE	SS41	2	2		32×4.5 F.B.
3	BRACKET	SS41	1	1	0.18	
2	SEAT	SS41	1	1	1.01	
1	POLE	SGP	1	1	5.0	

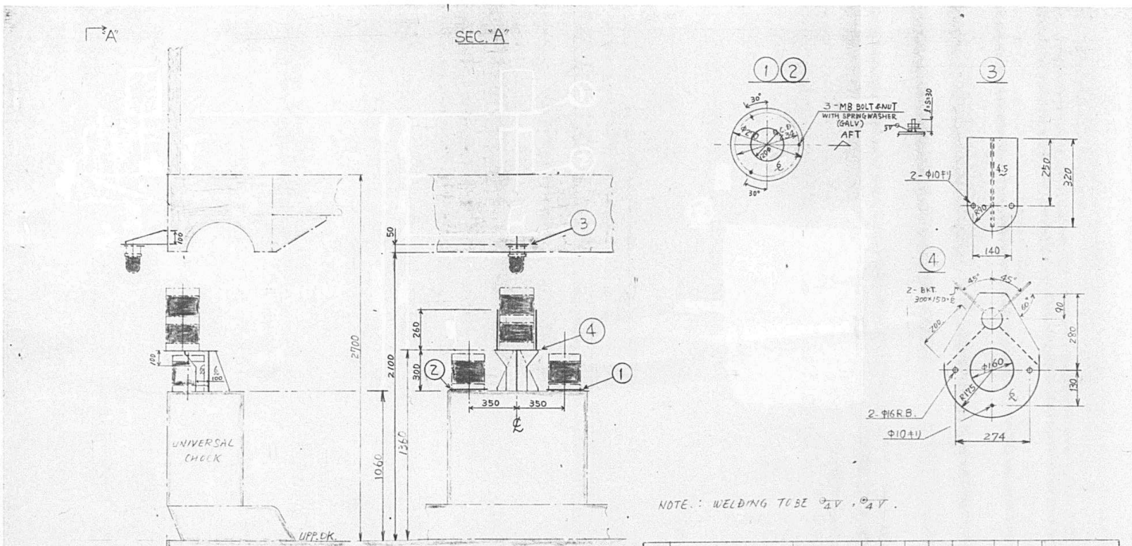
製造個数は 1 組 分を示す

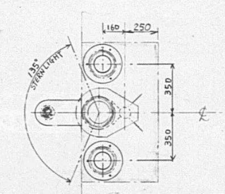
A-8 SEAT FOR LAMP

尺度 SCALE 1/10

TS 1323/4/5 DR. NO. 4120 555 PAGE 26

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NOTE.: WELDING TO BE $^{6}_{4}V$, $^{6}_{4}V$.

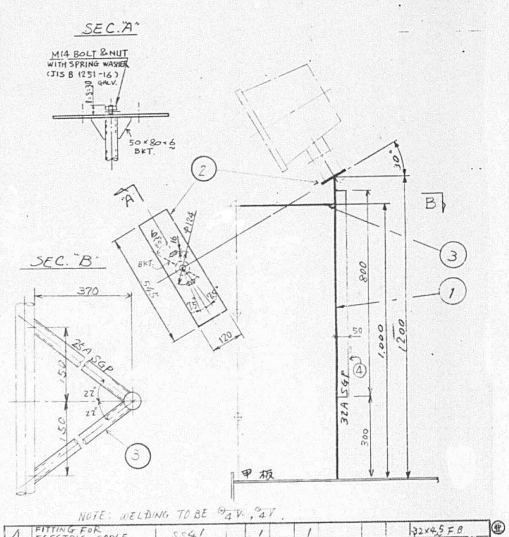
符号 NO.	名称 NAME	材料 MATERIAL	試験片 TEST PIECE	常用 USE	予備 SPARE	合計 TOTAL	関係工場 WORK SHOP	1個 ONE	合計 TOTAL	記事 REMARKS
4	SEAT OF STERN LIGHT	SS41 MILD STEEL		1		1	㊞ ㊤			
3	SEAT OF SUEZ CANAL SIGNAL LIGHT			1		1	㊞ ㊤			
2	SEAT OF ANCHOR LIGHT	SS41 MILD STEEL		1		1	㊞ ㊤			
1	SEAT OF ANCHOR LIGHT	SS41 SGP		1		1	㊞ ㊤			

製造個数は 1組 分を示す

(A-10) SEAT FOR SUEZ CANAL SIGNAL LIGHT & ANCHOR LIGHT & STERN LIGHT.

尺度 SCALE

TS 1323/4/5 DR. NO. 4120555 PAGE 27



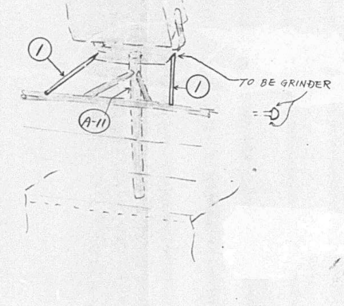
NOTE: WELDING TO BE $^{6}_{4}V$, $^{6}_{4}V$.

符号 NO.	名称 NAME	材料 MATERIAL	試験片 TEST PIECE	常用 USE	予備 SPARE	合計 TOTAL	関係工場 WORK SHOP	1個 ONE	合計 TOTAL	記事 REMARKS
4	FITTING FOR ELECTRIC CABLE	SS41		1		1				32×4.5 F.B
3	STAY	SGP STEEL PIPE		1		1		0.22		
2	SEAT	SS41 MILD STEEL		1		1		2.5		GALV.
1	POLE	SGP STEEL PIPE		1		1		3.8		

製造個数は 1組 分を示す

(A-11) SEAT FOR FLOOD LIGHT

尺度 SCALE 1/10



符号 NO.	名称 NAME	材料 MATERIAL	試験片 TEST PIECE	常用 USE	予備 SPARE	合計 TOTAL	関係工場 WORK SHOP	1個 ONE	合計 TOTAL	記事 REMARKS
1	SUPPORT	SS00				2	㊞㊤			19Φ R.B L=500 GALV.

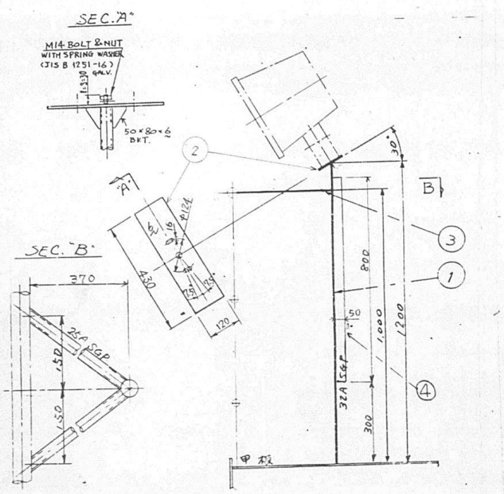
製造個数は 1組 分を示す

ADD. SUPPORT (A-11) FLOOD LIGHT.

尺度 SCALE

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製造表原紙



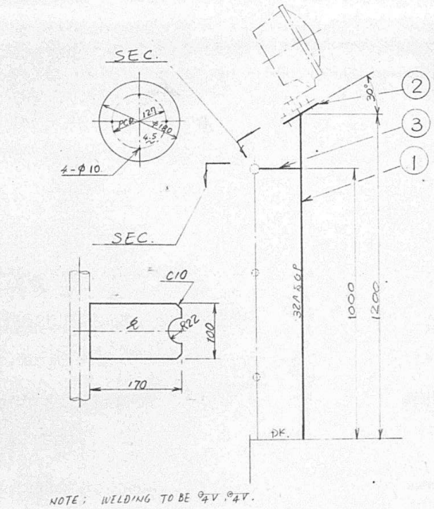
NOTE: WELDING TO BE ⁰4V, ⁰4V

符号 NO.	名称 NAME	材料 MATERIAL	試験片 TEST PIECE	常用 USE	予備 SPARE	合計 TOTAL	関係工場 WORK SHOP	1個 ONE	合計 TOTAL	記事 REMARKS
4	FITTING FOR ELECTRIC CABLE	SS41		1		1				32×4.5 F.B
3	STAY	SGP STEEL PIPE		1		1		0.72		GALVD.
2	SEAT	SS41 MILD STEEL		1		1		2.5		
1	POLE	SGP STEEL PIPE		1		1		3.8		

製造個数は 1組 分を示す　~~(1隻分)　隻分製造のこと。~~

(A-12) SEAT FOR FLOOD LIGHT　尺度 SCALE 1/10

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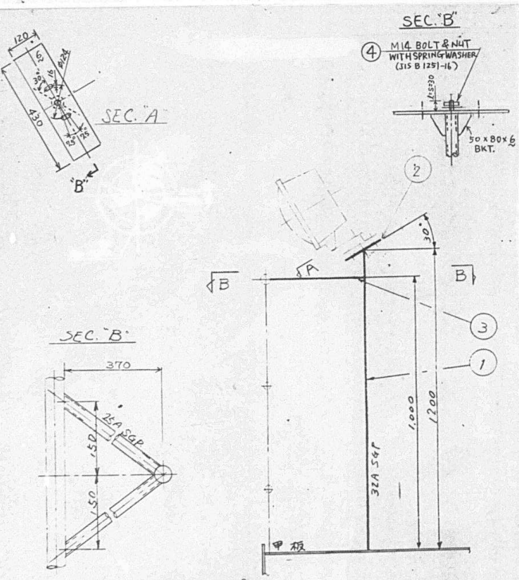
NOTE: WELDING TO BE ⁰4V, ⁰4V.

符号 NO.	名称 NAME	材料 MATERIAL	試験片 TEST PIECE	常用 USE	予備 SPARE	合計 TOTAL	関係工場 WORK SHOP	1個 ONE	合計 TOTAL	記事 REMARKS
3	BRACKET	SS41 MILD STEEL		1		1				GALVD.
2	SEAT	SS41 MILD STEEL		1		1				
1	POLE	SGP STEEL PIPE		1		1				

製造個数は 1組 分を示す　(1隻分)　~~隻分製造のこと。~~

(A-13) SEAT FOR FLOOD LIGHT　尺度 SCALE

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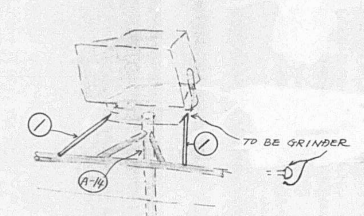


NOTE: WELDING TO BE ⁰4V, ⁰4V.

符号 NO.	名称 NAME	材料 MATERIAL	試験片 TEST PIECE	常用 USE	予備 SPARE	合計 TOTAL	関係工場 WORK SHOP	1個 ONE	合計 TOTAL	記事 REMARKS
4	BOLT & NUT	〃		1		1				GALVD
3	STAY	SGP STEEL PIPE		1		1		0.72		GALVD.
2	SEAT	SS41 MILD STEEL		1		1		2.5		
1	POLE	SGP STEEL PIPE		1		1		3.8		

製造個数は 1組 分を示す

(A-14) SEAT FOR FLOOD LIGHT　尺度 SCALE 1/10



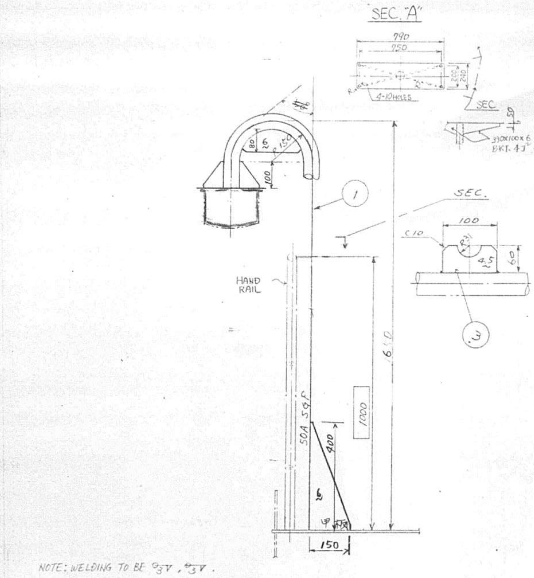
符号 NO.	名称 NAME	材料 MATERIAL	試験片 TEST PIECE	常用 USE	予備 SPARE	合計 TOTAL	関係工場 WORK SHOP	1個 ONE	合計 TOTAL	記事 REMARKS
1	SUPPORT	SS00				2				19φRB l=500 GALV

製造個数は 1組 分を示す

ADD. SUPPORT (A-14) FLOOD LIGHT　尺度 SCALE

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NOTE: WELDING TO BE $^{0}3V$, $^{0}3V$.

符号 NO.	名称 NAME	材料 MATERIAL	試験片 TEST PIECE	常備 USE	予備 SPARE	合計 TOTAL	関係工場 WORK SHOP	1個 ONE	合計 TOTAL	記事 REMARKS
3	BRACKET	SS41 MILD STEEL		1		1			0.18	GALV'D
2	SEAT	SS41 MILD STEEL		1		1			1.01	
1	POLE	SGP STEEL PIPE		1		1			5.0	STAYを含む

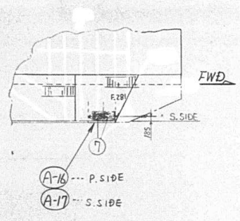
製造個数は 1組 分を示す

A-15 SEAT FOR CEILING LIGHT — 尺度 SCALE 1/10

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ARRG. OF SIDE LIGHT (P & S)

CREW. DK. PLAN (S.SIDE)



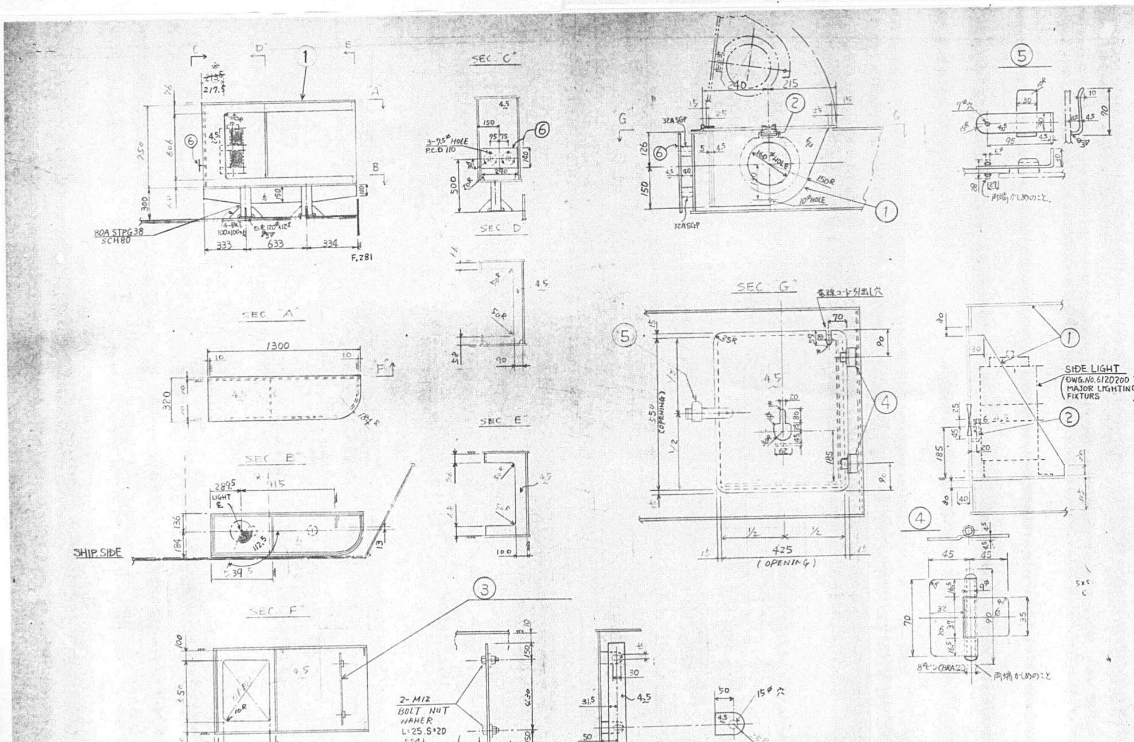
WORKING NOTE
1) 本図は右舷付を示す. 左舷付は本図と対称のこと。
2) 取付後は外面指定色. 内面は黒艶消しペイント塗装のこと。
3) ※印寸法は特に正確を要す.
4) 溶接は特記の他は $^{0}4V$ 及び $^{0}4V$ とする。

符号 NO.	名称 NAME	材料 MATERIAL	試験片 TEST PIECE	常備 USE	予備 SPARE	合計 TOTAL	関係工場 WORK SHOP	1個 ONE	合計 TOTAL	記事 REMARKS
7	CARLING	CLASS STEEL				2				90×9 F.B. L=900
6	SEAT OF RECEPTACLE	SS41, SGP				1				
5	STOPPER	SS41				1 SET				
4	HINGE	SS41, BRASS				2				
3	SHEAD. PLATE	SS41				1 SET				2-M12 BOLT & NUT を含む
2	HOOK FOR SIDE LIGHT	〃				1				
1	SEAT OF SIDE LIGHT	SS41				1 SET				

製造個数は 1組分を示す

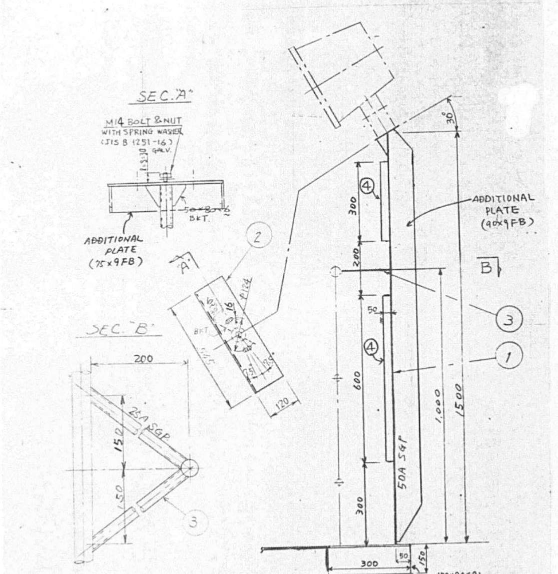
A-16 A-17 SEAT FOR SIDE LIGHT (1/2) 尺度 SCALE

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A-16 A-17 SEAT FOR SIDE LIGHT (1/2) 尺度 SCALE

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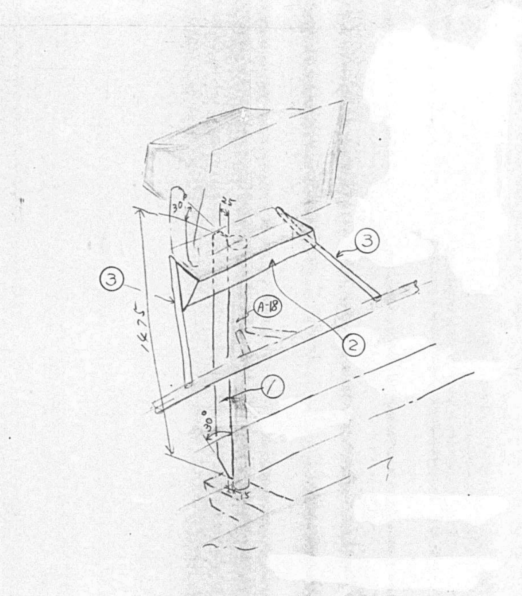


NOTE: WELDING TO BE 4V OR 4V

4	FITTING FOR ELECTRIC CABLE	SS41		2		2				32×4.5 F.B.
3	STAY	SGP STEEL PIPE		1		1			0.22	
2	SEAT	SS41 MILD STEEL		1		1			2.5	GALVD.
1	POLE	SGP STEEL PIPE		1		1			3.8	150×90×9L と含む
符号 NO.	名称 NAME	材料 MATERIAL	試験片 TEST PIECE	常備 USE	予備 SPARE	合計 TOTAL	関係工場 WORK SHOP	1個 ONE	合計 TOTAL	記事 REMARKS

製造個数は 1組 分を示す

A-18 SEAT FOR FLOOD LIGHT — 尺度 SCALE 1/10



3	SUPPORT	SS400				2				19φRB ℓ=800 GALV.
2	ADDITIONAL PLATE	〃				1	〃			75×9FB ℓ=650 GALV.
1	ADDITIONAL PLATE	SS400				1				90×9FB GALV. ℓ=1475
符号 NO.	名称 NAME	材料 MATERIAL	試験片 TEST PIECE	常備 USE	予備 SPARE	合計 TOTAL	関係工場 WORK SHOP	1個 ONE	合計 TOTAL	記事 REMARKS

製造個数は 1組 分を示す

ADD. SUPPORT FOR A-18 FLOOD LIGHT — 尺度 SCALE

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1/4

ALT. NO.	OWNER DATE	OWNER LETTER NO.	USCG DATE	USCG LETTER NO.	ABS DATE	ABS LETTER NO.	USPH DATE	USPH LETTER NO.
ORIGINAL	July 22 '85	OFTT/686-770						

APPROVAL OF OWNER & REGULATORY BODIES

FINISHEDPLAN

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SHIPYARD AND SHIP'S NO. & NAME			
MITSUI TAMANO		MITSUBISHI KOBE	
NO.1323	DOCTOR LYKES	NO.1158	JAMES LYKES
NO.1324	ALMERIA LYKES	NO.1159	JOSEPH LYKES
NO.1325	TILLIE LYKES	NO.1164	SOLON TURMAN

MITSUI ENGINEERING & SHIPBUILDING CO., LTD.
TAMANO WORKS

SHIP DESIGN DEPARTMENT MANAGER — SHIP'S NO. **NO.1325** — SHIP'S NAME **TILLIE LYKES**

OUTFITTING DESIGN SECTION
SEC. CHIEF

NOV 10 1986
SHIP DESIGN DEPARTMENT

フォアマスト装置
ARR. OF FORE MAST

DATE '84 (TE 42235)

JOB NO. TS1323/24/25 — SCALE 1/50 — LYKES REF. NO. 170204 — MITSUI DRAWING NO. 4120530

JOBCLASSIF. NO. D.20.05

(4 SHEETS WITH COVER)

2/4

PLAN RECORD

ALT. NO.	MARK	ALTERATION/DESCRIPTION	DATE & SIGNATURE
1		PREPARED FOR S.NO. 1323 AS FINSHED PLAN, MADE APPLICABLE TO S.NO. 1324 AND S.NO. 1325.	NOVEMBER, 20, 86

DWG. NO. 4120530

3/4

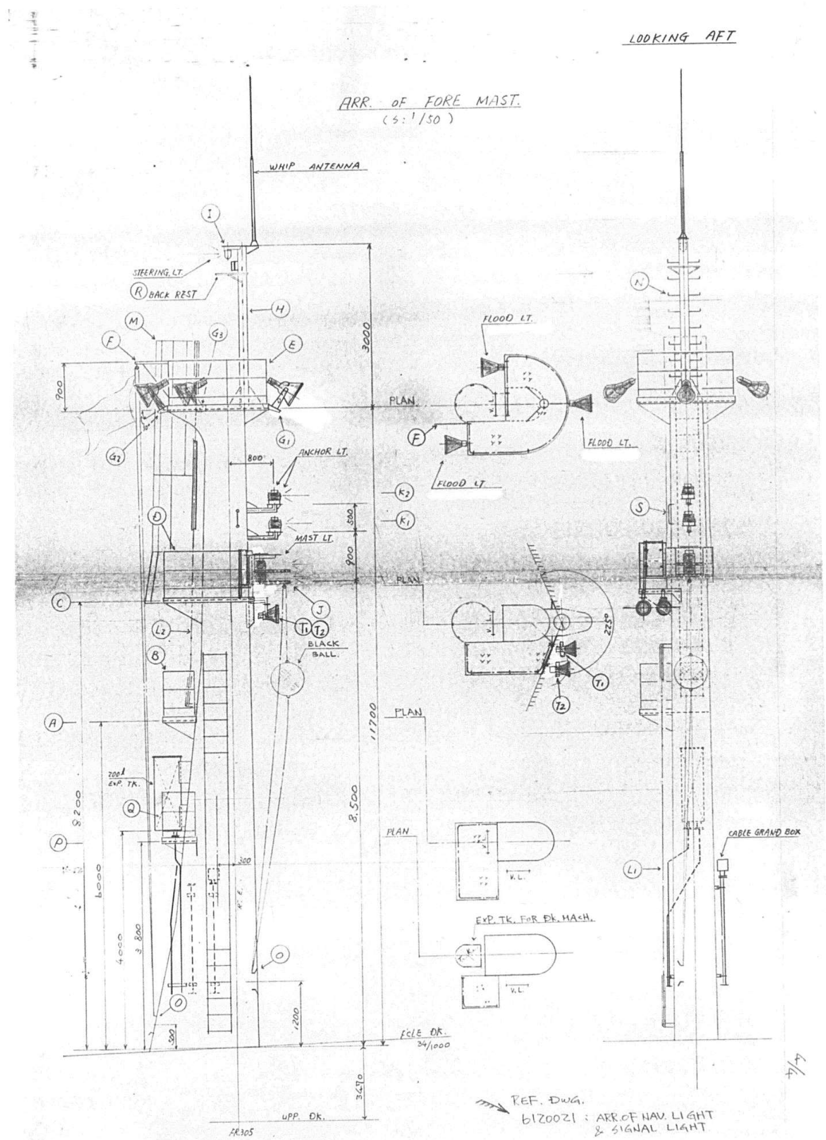
符号 NO.	名称 NAME	材料 MATERIAL	試験片 TEST PIECE	常備 USE	予備 SPARE	合計 TOTAL	関係工場 WORK SHOP	1個 ONE 重量(kg) WEIGHT	合計 TOTAL	記事 REMARKS
T2	SPEAKER SEAT	SS41 MILD STEEL				1				
T1	SPEAKER SEAT	SS41 MILD STEEL				1				
S	HAND GRIP	SS41 MILD STEEL				1				
R	BACK REST	SS41 MILD STEEL				SET 1				
Q	STAGE HAND RAIL	S.G.P. MILD STEEL				SET 1				
P	STAGE (EXP. TK. MAINT.)	SS41 MILD STEEL				SET 1				
O	CLEAT	SS41 MILD STEEL				SET 1				
N	STEP					16				
M	CAGE					SET 1				PROVIDED ACC. TO USCG 46-5108.160
L2	VERTICAL LADDER					SET 1				
L1	VERTICAL LADDER	SS41 MILD STEEL				SET 1				
K2	ANCHOR LT. SEAT	S.G.P. MILD STEEL				SET 1				
K1	ANCHOR LT. SEAT	S.G.P. MILD STEEL				SET 1				
J	MAST LT. SEAT.	S.G.P. MILD STEEL				1				
I	WHIP ANTENNA & STEERING LT. SEAT	SS41 MILD STEEL				1				
H	TOP MAST BODY	S.T.P.G MILD STEEL				SET 1				
G3	FLOOD LT. SEAT	SS41 MILD STEEL				1				
G2	〃 〃					1				
G1	FLOOD LT. SEAT.					1				
F	FLAG YARD	SS41 MILD STEEL				1				
E	MAST TOP STAGE HAND RAIL	S.G.P MILD STEEL				SET 1				
D	MID STAGE HAND RAIL	S.G.P. MILD STEEL				SET 1				
C	MID. STAGE	SS41 MILD STEEL				SET 1				
B	LOW STAGE HAND RAIL	S.G.P MILD STEEL				SET 1				
A	LOW STAGE	SS41 MILD STEEL				SET 1	(M), (+)			

製造個数は 1組 分を示す　1組（1隻分）　3 隻分製造のこと。

LIST OF FORE MAST. — 尺度 SCALE 1/50

TSO. 1323/4/5 — DR. NO. 4120530 — PAGE

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LOOKING AFT
ARR. OF FORE MAST.
(S: 1/50)
WHIP ANTENNA
STEERING LT.
BACK REST
FLOOD LT.
PLAN
ANCHOR LT.
MAST LT.
BLACK BALL.
CABLE GRAND BOX
EXP. TK. FOR DK. MACH.
FCLE DK.
UPP. DK.
FR.105
REF. DWG.
6120021 : ARR. OF NAV. LIGHT & SIGNAL LIGHT

927

APPROVAL OF OWNER & REGULATORY BODIES								
ALT. NO.	OWNER		USCG		ABS		USPH	
	DATE	LETTER NO.	DATE	LETTER NO.	DATE	LETTER NO.	DATE	LETTER NO.
ORIGINAL	24 JUL '86	OFTS/MES-777						
1ST PART REV	16 SEP '86	TAM/66						
2ND PART REV	4 NOV '86	TAM/103						

FINISHEDPLAN

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SHIPYARD AND SHIP'S NO. & NAME			
MITSUI TAMANO		MITSUBISHI KOBE	
NO.1323	DOCTOR LYKES	NO.1158	JAMES LYKES
NO.1324	ALMERIA LYKES	NO.1159	JOSEPH LYKES
NO.1325	TILLIE LYKES	NO.1164	SOLON TURMAN

MITSUI ENGINEERING & SHIPBUILDING CO., LTD.
TAMANO WORKS

SHIP DESIGN DEPARTMENT — SHIP'S NO. 1325 — SHIP'S NAME TILLIE LYKES

STRUCTURE DESIGN SEC.

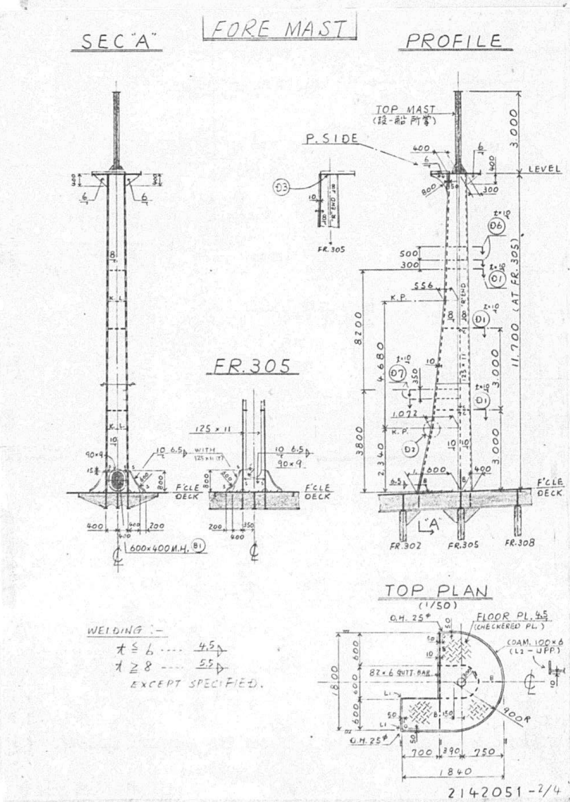
マスト構造
MAST CONSTRUCTION

DATE (TEL 2230)
JOB NO. TS1323/24/25
LYKES REF. NO. 170205
MITSUI DRAWING NO. 2142051 R

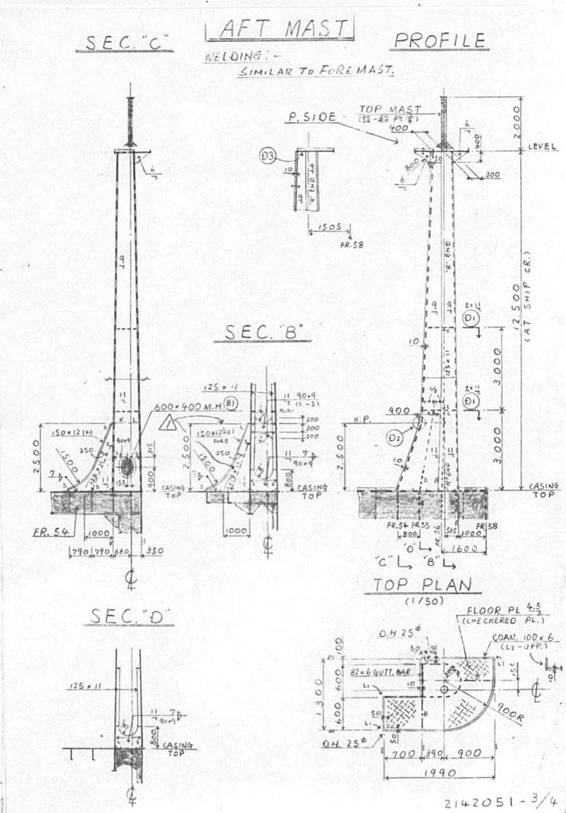
(5 SHEETS WITH COVER)

PLAN RECORD			
ALT. NO.	MARK	ALTERATION/DESCRIPTION	DATE & SIGNATURE
		"PREPARED FOR S.NO. 1323 AS FINISHED PLAN, CHANGED AS FOLLOWS.	
		1 --- MISCELLANEOUS REVISION.	NOV. 28. '86
		MADE APPLICABLE TO S.NO. 1324 AND S.NO. 1325."	

DWG. NO. 2142051 - 1/4

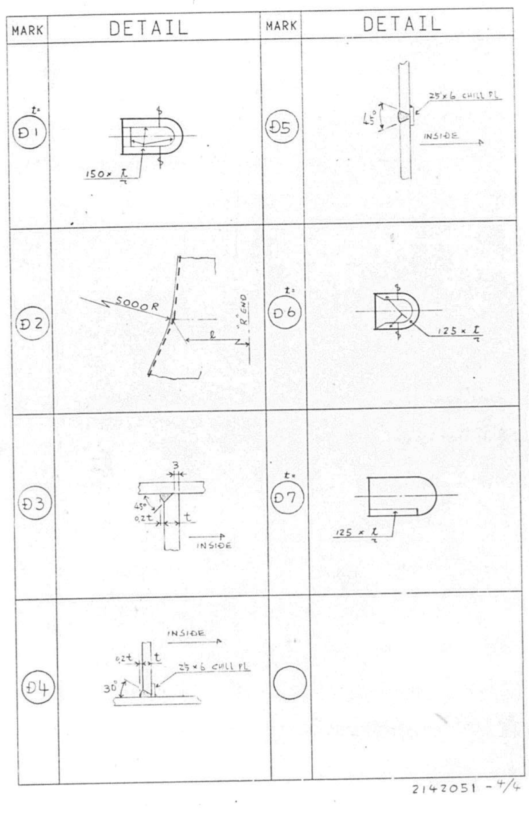


2142051 - 2/4



2142051 - 3/4

928


MARK
DETAIL
D1
150 × t
D2
5000R
D3
3
45°
0.2t
t
INSIDE
D4
INSIDE
0.2t
t
25×6 CHILL PL
30°
D5
45°
25×6 CHILL PL
INSIDE
D6
125 × t
D7
125 × t
2142051 - 4/4

APPROVAL OF OWNER & REGULATORY BODIES

ALT. NO.	OWNER DATE	OWNER LETTER NO.	USCG DATE	USCG LETTER NO.	ABS DATE	ABS LETTER NO.	USPH DATE	USPH LETTER NO.
ORIGINAL	12 MAR 1985	OFTS/MES/170 OFTS/MES/181						
REV. A	04 JUL 1986	OFTS/MES/666						
A-1	4.11.85	TAM/WDMcC						
A-2	25.11.85	TAM/WDMcC						
A-3	5.3.86	TAM/WDMcC						

FINISHEDPLAN

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SHIPYARD AND SHIP'S NO. & NAME

MITSUI TAMANO		MITSUBISHI KOBE	
NO.1323	DOCTOR LYKES	NO.1158	JAMES LYKES
NO.1324	ALMERIA LYKES	NO.1159	JOSEPH LYKES
NO.1325	TILLIE LYKES	NO.1164	SOLON TURMAN

MITSUI ENGINEERING & SHIPBUILDING CO.,LTD.
TAMANO WORKS

SHIP DESIGN DEPARTMENT — MANAGER
SHIP'S NO. 1325 — SHIP'S NAME TILLIE LYKES

CO-ORDINATION SECTION — SEC. CHIEF

PAINTING SCHEDULE
塗装要領

DATE (TEL.2222)
JOB NO. TS1323/24/25 — SCALE — LYKES REF. NO. 190101 — MITSUI DRAWING NO. 3101001
JOBCLASSIF. NO.

(SHEETS WITH COVER)

A TABLE OF CONTENTS

2. PLAN-RECORD

ALT. NO.	MARK	PAGE	DESCRIPTION	DATE
			PREPARED FOR APPROVAL OF OWNER	JAN. 30 1985
			PREPARED FOR S.No.1323 AS FINISHED PLAN, MADE APPLICABLE TO S.No.1324 AND S.No.1325	DEC. 8 1986

3. GENERAL NOTE

1. This drawing shows the typical schedule of painting.

   Condition of the surface to be painted (i.e. steel, galvanized, bronze, aluminium, etc.) which is indicated in "APPLICATION PART" column of this drawing is not finally decided by this drawing but is determined by other detail drawing.

   Thus, should be revealed any discrepancy of the material mentioned in "APPLICATION PART" of this drawing, revision is to be made in accordance with the material governing drawings.

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4 GENERAL DESCRIPTION FOR PAINTING (1/3)

1. All paint works including surface preparation and application of shop primer shall be perfomed in compliance with the Specifications and the Builder's practice considering Paint manufacturer's recommendations and Owners' satisfaction. However if disputation between the Owner and MES should exist in the judgement of surface preparation and painting job, the final decision shall be made in consultation with three (3) parties concerned (Owner,MES and Paint maker).

   Technical supervision to be provided by the paint manufacturer during the surface preparation and application of paint.

2. Painting works shall be performed by "Airless" spray as far as possible, and roller and/or hand brush shall be used where the use of airless spray is resticted due to the lack of working spaces, etc.
   If more than one coat is applied minimum and maximum over-coating time specified by the paint manufacturer to be followed.

3. Water soluble paint shall be used instead of specified paints in very narrow spaces, etc. Where the application of oleoresinous paint, etc. are dangerous from the view point of safety of workers.

4. Sparp edges and unsmoothed surfaces caused by gas cutting of hull structural members or similar shall be finished by grinding, discsanding, etc. to ensure adequate preparation for painting otherwise plate edges shall be left untreated.

5. Generally, inside of totally enclosed water-/air-tight spaces, galvanized parts, chromium plated parts, brass, bronze, aluminium, stainless steel, plastic, glass, rubber, etc. shall not be coated with paint unless otherwise specified.

6. Dry film thickness in this drawing ;

   1) Dry film thickness in this drawing, means that dry film thickness is equal to or above the specified thickness at 85% of measuring points and minimum thickness is 75% of specified thickness on remaining measuring points. However, the required film thickness of the anti-fouling system shall be maintained to full thickness for the forward 52 meter of the vessel length.

   2) Considering that the above system is statistic means, measuring points shall be sufficient in number and scattered as reasonably as possible.

   3) If the number of deficient areas are small in total and widely spread, only these areas shall be recoated. However if the deficiencies are concentrated in local areas then the total local area in which these dificiencies occur shall be recoated subject to the agreement with the Owner's supervisor and the Builder.

4 GENERAL DESCRIPTION FOR PAINTING (2/3)

7. Dry film thickness specified for the spaces in Table-1 shall be measured and confirmed by the Builder, except for equipment, such as pipes, supports, bands, etc. in such spaces.

Table 1

Place to be painted \ Measurement of dry film thickness	After completion of coating of A/C	After completion of final coat
Outside of shell, Exposed weather deck, Exterior of deck house	P	P
Water ballast tank, Cargo holds	-	P
Fresh water tank	-	P

Note :

P : Paint manufacturer's and Builder'S inspectors shall attend for measurement.

8. Time schedule of painting of each coat and inspection shall be decided according to the Builder's construction schedule considering Paint manufacturer's recommendations.

9. The Builder shall inform the Owner's supervisor of all inspection schedules which cover the inspections after surface preparation and after completion of painting.

10. No stages shall be removed prior to a Builder's scheduled inspection.

11. Cleaning of dust, dirt, oil, etc. shall be carried out in accordance with the Builder's standard practice in accordance with paint manufacturer's recommendations.

12. Pinhole test shall not be carried out.

13. Relatively small damage to the galvanizing as a result of fabrication on the spot affected by inavoidable welds after galvanizing shall be cleaned by power wire brushes and touched up with zinc rich primer.

4 GENERAL DESCRIPTION FOR PAINTING (3/3)

14. For color of C.A/C and CHR A/C, reddish color which is one of paint maker's standard may be used instead of light gray color specified in this drawing.

15. Hull roughness

    Quality control to be strictly applied to the anti-corrosive and anti-fouling coating on the underwater hull roughness mean apparent amplitude (MAA) approximately 125 microns per 50 mm.

    The advice of tMe Paint manufacturer is to be followed to ensure that as far as possible this level of roughness is not exceeded.

    In this respect, hull roughness readings to be taken after application of the anti-fouling paint in general, but damage to anti-corrosive paint must be repaired prior to coating with anti-fouling paint.

    The method of using the roughness gauge and analysing the result is to be as per BSRA stated practice but the hull roughness measuring is to be performed by the Paint manufacturer.

    The finished hull roughness is to be measured prior to undocking by the BSRA Roughness Gauge and a report of the final hull roughness measurement is to be prepared by the Paint manufacturer and submitted to the Owners supervisor before the vessel leaves the dock.

5. LIST OF PAINTS TO BE USED (1/3)

PAINTS IN THE FOLLOWING LIST SHALL BE USED IN PAINTING SCHEDULE

MAKER	ABBREVIATION	BRAND NAME	THEORETICAL COVERAGE KG/M² /COAT	DRY FILM THICKNESS MIC./COAT	TYPE OF PAINT	APPLICATION PARTS
NIPPON PAINT CO., LTD.	——	NIPPE ZINKY 1000 FZ	0.085	15	ZINC DUST/MODIFIED ALKYL SILICATE SHOP PRIMER(TWO COMPONENT)	SHOP PRIMER
	T/E A/C	EPOTAR M A/C	0.247	125	COAL TAR EPOXY	BOTTOM ZONE
	V/T	VINITAR A/C	0.145	50	VINYL/TAR ANTI-CORROSIVE	DITTO
	SP A/F	INTERSMOOTH HISOL SPC 200	0.30 L	150	SELF-POLISHING ANTI-FOULING	DITTO
	CHR BA/C	RABACOAT A/C	0.118	40	CHLORINATED RUBBER /ALUMINUM ANTI-CORROSIVE	TOPSIDE ZONE. FOCSLE SHELL
	CHR A/C	RABACOAT PRIMER	0.121	40	CHLORINATED RUBBER PRIMER	WEATHER DECK. DECK HOUSE EXTERIOR. OUTFITTING ON WEATHER PART
	CHR T/S	RABACOAT FINISH	0.090	30	CHLORINATED RUBBER FINISH	TOPSIDE ZONE. FOCSLE SHELL
	CHR F/P	RABACOAT FINISH	0.090	30	DITTO	DECK HOUSE EXTERIOR. OUTFITTING ON WEATHER PART
	CHR D/P	RABACOAT FINISH	0.090	30	DITTO	EXPOSED WEATHER DECK
	T/E HB	EPOTAR MX	0.38	200	COAL TAR EPOXY/ HIGH BUILD	FOUNDATION OF DECK MACHINERY. STEEL SURFACE BEHIND MODULAR LINING PANEL
	T/E	EPOTAR MT	0.223	100	COAL TAR EPOXY	WATER BALLAST TANK. CHAIN LOCKER. BILGE WELL.VOID.COFF. BATTERY ROOM FLOOR
	T/E NB	EPOTAR M NB	0.218	100	BLEACHED TAR EPOXY	TANK TOP IN ENG.RM. CARGO HOLD BOTTOM. MACHINERY SEAT ON TANK TOP IN ENG RM
			0.273	125		CARGO HOLD EXCEPT ABOVE. HATCH COVER INSIDE. DUCT KEEL
	C.A/C	NIPPE US PRIMER HB	0.104	35	SPECIAL ALKYD RESIN RUST PREVENTIVE PRIMER	ACCOMMODATION SPACE. MACHINERY SPACE. ENGINE ROOM. OUTFITT.IN THESE RM
	C.WHITE A/C	CR MARINE WHITE PRIMER	0.101	35	ALKYD/WHITE PRIMER	DITTO
	C.F/P	CR MARINE F	0.080	30	ALKYD FINISH	DITTO
	C.D/P	CR MARINE DECK	0.090	30	PHENOL ALKYD FINISH	ACCOMMODATION SPACE. MACHINERY SPACE. ENGINE ROOM
	C.D/R F/P	NEW BODELAC 200	0.063	25	ALKYD FINISH	FWD MACH.SPACE. STEERING GEAR RM. MAIN ENGINE. AUX. MACHINERY
	P/E GLASS FLAKE	INTERGARD GLASS FLAKE	0.544 L	500	EPOXY MODIFIED POLYAMIDE FILLED WITH GLASS FLAKE	BOW THRUSTER TUNNEL

MITSUI ENGINEERING & SHIPBUILDING CO., LTD.

5. LIST OF PAINTS TO BE USED (2/3)

PAINTS IN THE FOLLOWING LIST SHALL BE USED IN PAINTING SCHEDULE

MAKER	ABBREV-IATION	BRAND NAME	THEORET-ICAL COVERAGE KG/M² /COAT	DRY FILM THICKNESS MIC./COAT	TYPE OF PAINT	APPLICATION PARTS
NIPPON PAINT CO., LTD.	LATEX PAINT	HI-VINILEX 20	0.103	30	POLYVINYL ACETATE EMULSION	SURFACE OF GLASS CLOTH
	H/R A/P	NIPPE TAINETSU 20	0.054	20	ALKYD/HEAT RESISTANT FINISH	INSIDE OF FUNNEL, BOILER, HEATED SURFACE
	P/E A/C	NIPPE EPOXY PRIMER	0.222 L	70	PURE EPOXY PRIMER	CEILING & WALL IN BATTERY ROOM
	P/E F/P	NIPPE EPOXY FINISH HB	0.150 L	70	PURE EPOXY FINISH	DITTO
	P/E A/C FWT	ORGA 1000-4P	0.141 L	70	PURE EPOXY PRIMER	POTABLE WATER TANK, INSIDE OF GARBAGE CHUTE & PIPE.
	P/E F/P FWT	ORGA 1000-4F	0.142 L	70	PURE EPOXY FINISH	SWIMMING POOL INSIDE
	I/Z	NIPPE ZINKY 1000 QC	0.357	75	ZINC DUST/ALKYL SILICATE	EXHAUST GAS PIPE, HATCH COVER OUTSIDE, EXTERIOR STEEL LADDER
	B/C	AENT PRIMER	0.112	35	SPECIAL SYNTHETIC RESIN PRIMER	BINDER COAT FOR GALVD SURFACE
	CHR SEALER	RABACOAT SEALER	0.151	40	SYNTHETIC RUBBER TIE COAT	HATCH COVER OUTSIDE, EXTERIOR STEEL LADDER
	S. W/P	VINILEX 110 ACTIVE PRIMER	0.089	7	SHORT-EXPOSURE WASH PRIMER	BINDER COAT FOR GALVD SURFACE IN POT.W.TK
	—	NIPPE ACRYL			ACRYL LACQUER PAINT	COMPANY NAME MARK
CHUGOKU MARINE PAINTS LTD.	—	RUST INHIBITIVE OIL"CK"	0.040	20	PETROLEUM RESIN	FUEL OIL TANK, DIESEL OIL TANK
USAGIDA CHEMICAL WORKS LTD.	B/S	BISMATIC SOLUTION NO.301	0.15	40	BITUMINOUS PAINT	INSIDE OF RUDDER, ETC.

5. LIST OF PAINTS TO BE USED (3/3)

PAINTS IN THE FOLLOWING LIST SHALL BE USED IN PAINTING SCHEDULE

MAKER	ABBREV-IATION	BRAND NAME	THEORET-ICAL COVERAGE KG/M² /COAT	DRY FILM THICKNESS MIC./COAT	TYPE OF PAINT	APPLICATION PARTS
T.CHATANI & CO.,LTD.	ANTI-SWEAT PAINT SEALER	SECULATE PRIMER	0.30	1 MM	ANTI-CONDENSATION COMPOUND	STEERING GEAR ROOM
	ANTI-SWEAT PAINT	SECULATE COMPOUND	1.25			

6. COLOR SAMPLE (FINAL COLOR ONLY)

COLOR	SAMPLE	TYPICAL APPLICATION PART
PLUM (STANDARD COLOR OF SP A/F)	(MAKERS STANDARD)	BOTTOM ZONE
BLACK		TOPSIDE ZONE
AL-GRAY LYKES (SURF GRAY: F684)		DECK HOUSE EXTERIOR, MAST & POST, CARGO HATCH COVER & COAMING, HAND RAIL ON WEATHER PART, MOORING FITTING, BOAT WINCH, STORE CRANE, ETC.
STORM GRAY (K724)		EXPOSED WEATHER DECK, FLOOR OF DECK HOUSE INTERIOR INCUDING STORES, LOCKERS, MACHINERY SPACES, WINDLASS, MOORING WINCH, ETC.
RED (L274)		UPPER SURFACE OF PARTIAL DECK IN ENGINE ROOM,
LIGHT GRAY (STANDARD COLOR OF T/E NB)	(MAKERS STANDARD) (NEAR N 6.5)	TANK TOP IN ENGINE ROOM, GENERATOR SEAT, CARGO HOLD, DUCT KEEL, INSIDE OF HATCH COVER & COAMING, ETC.
SILVER	(MAKERS STANDARD)	FUNNEL INSIDE, BOILER, HEATED SURFACES, ETC.
7.5BG7/2		MAIN ENGINE, AUXILIARY MACHINERY, ELECTRIC EQUIPMENT, ETC.
5R4/13		EMERGENCY DEVICES
WHITE		CEILING AND WALL OF DECK HOUSE INTERIOR, MACHINERY SPACE, ENGINE ROOM & CARGO HOLD.
BLUE (STANDARD COLOR OF P/E F/P FWT)		SWIMMING POOL INSIDE, ETC.
DARK BLUE (OCEAN BLUE: E992)		FUNNEL MARK AND BOW MARK
LIGHT BLUE (7.5 B MAX)		BOW MARK
RED (7.5 R MAX)		BOW MARK
LYKES BLUE (285 C)		COMPANY NAME MARK
APL BLUE (CARIBBEAN BLUE C935)		FUNNEL OUTSIDE
APL RED (ENSIGN RED B295)		FUNNEL OUTSIDE

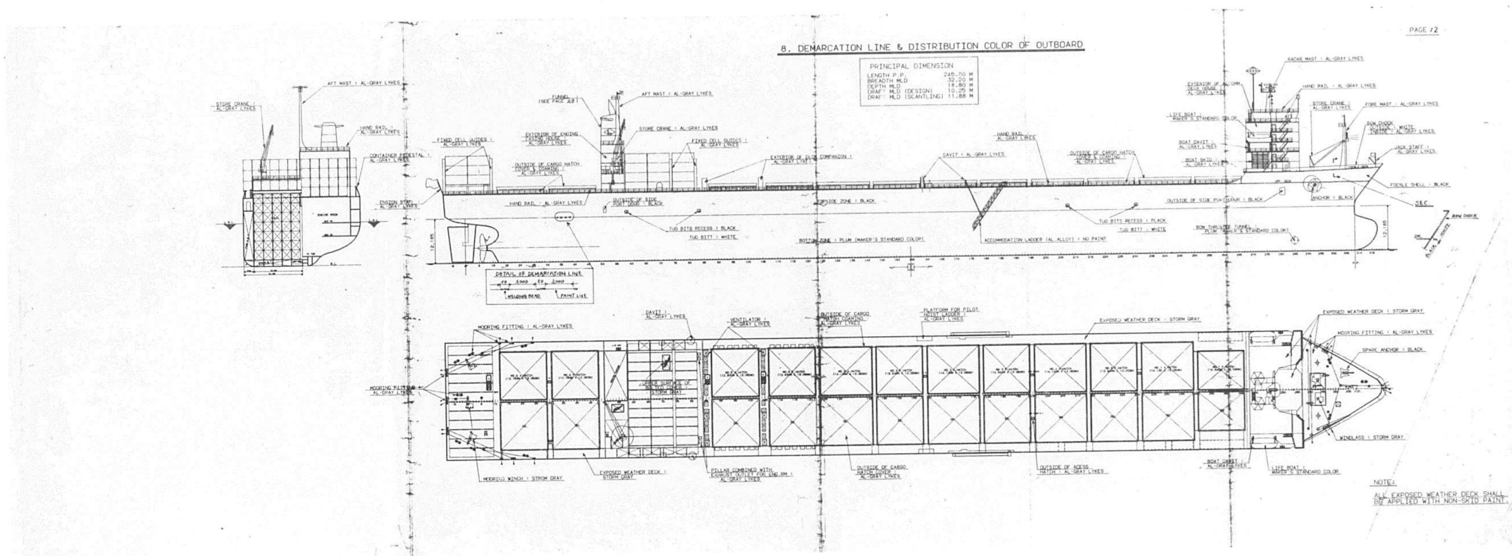
7. IDENTIFICATION OF PIPE LINE

1. FOR ENGINE ROOM:
   1). PIPES IN ENGINE ROOM AND SHAFT TUNNEL SHALL BE PAINTED TO ALL LENGTH WITH FOLLOWING COLOUR RESPECTIVELY.
   2). VALVE HANDLES AND VALVE BODY SHALL BE PAINTED WITH FOLLOWING COLOUR.
   VALVE HANDLES AND VALVE BODY SITUATED BELOW FLOOR PLATE: SAME COLOUR AS ATTACHED PIPING.
   VALVE HANDLES SITUATED ABOVE FLOOR PLATE: SAME COLOUR AS ATTACHED PIPING.
   VALVE BODY SITUATED ABOVE FLOOR PLATE: WHITE

SYSTEM	COLOUR	MUNCELL NO. MAKER'S COLOUR NO.	COLOUR SAMPLE
STEAM	SILVER		
STEAM DRAIN, EXHAUST STEAM	DARK BLUE	10B3.5/7.0 (C935)	
FUEL OIL (HEAVY OIL)	BLACK		
DIESEL OIL	TEAK	3.5YR4/6 (M231)	
LUBE OIL (INCLUD.CYL.OIL)	YELLOW AND PURPLE STRIPES	1.5Y7.5/16 (B134) 2.5P5/5 (K12-937)	
COOLING SEA WATER, BALLAST WATER, BILGE	GREEN	8.2GY6.5/5.5 (F445)	
BOILER WATER (INCLUD.FEED & COND.)	YELLOW	1.5Y7.5/16 (B134)	
POTABLE WATER	LIGHT BLUE	6.5BG7/3.5 (D441)	
COMPRESSED AIR (INCLUD.CONTROL AIR)	GRAY	N-5.5 (K724)	
FIRE	RED	5R4/13	
FRESH WATER, HOT WATER, COOLING FRESH WATER	BLUE	10B5/10 (K11-746)	
OTHER SYSTEM	WHITE		

2. FOR INTERIOR SPACES EXCEPT ENGINE ROOM:
   PIPES IN INTERIOR SPACES EXCEPT ENGINE ROOM AND SHAFT TUNNEL SHALL BE MARKED WITH DIFFERENT COLOURED TAPES WHICH ARE AVAILABLE IN THE MARKET, TO DISTINGUISH THE SYSTEM OF PIPING EASILY.
   AS FOR DETAILED SCHEDULE OF IDENTIFICATION, REFER TO THE DARWING NO.4116003 "PIPE COLOUR IDENTIFICATION SCHEDULE (HULL PART)".

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8. DEMARCATION LINE & DISTRIBUTION COLOR OF OUTBOARD
PRINCIPAL DIMENSION
LENGTH P.P. 245.00 M
BREADTH MLD 32.20 M
DEPTH MLD 18.80 M
DRAFT MLD (DESIGN) 10.25 M
DRAFT MLD (SCANTLING) 11.88 M
RADAR MAST : AL-GRAY LYKES
HAND RAIL : AL-GRAY LYKES
STORE CRANE : AL-GRAY LYKES
FORE MAST : AL-GRAY LYKES
LIFE BOAT : MAKER'S STANDARD COLOR
BOAT DAVIT : AL-GRAY LYKES
BOAT SKID : AL-GRAY LYKES
JACK STAFF : AL-GRAY LYKES
DAVIT : AL-GRAY LYKES
FOCSLE SHELL : BLACK
WINDLASS : STORM GRAY
NOTE:
ALL EXPOSED WEATHER DECK SHALL BE APPLIED WITH NON-SKID PAINT.

9. SURFACE PREPARATION BEFORE PAINTING (1/3)

Surface preparation before painting and shop-priming shall be carried out as follows :

1. SURFACE PREPARATION FOR STRUCTURAL MEMBERS :

1-1. Primary surface preparation

1) Shot-blasting

Following steel plates shall be shot-blasted by the centrifugal wheels at the state of raw material:

a) All surfaces of steel plates and sections of 4.6 mm and above in thickness for hull structural member which are to be coated with paint.

b) The inside of hull structural tanks for fuel oil, diesel oil, lubricating oil and other oils for machinery use.

c) Steel plates and sections of 4.6 mm and above in thickness for masts, posts, booms and foundation of large machinery.

Other steel plates and sections, equipment, pipes, etc. shall not be shot-blasted unless required for paint application or other surface preparations.

Generally, the grade of surface preparation shall be Sa 2 1/2 of SIS (Swedish Standard SIS 05 59 00-1967) for steel plates and Sa 2 of SIS for sections. Where required for painting such as coal tar epoxy, surface preparation for sections shall be Sa 2½ of SIS.

2) Shop primer

The shot-blasted surfaces which are to be coated with paint shall be applied with shop primer immediately after shot-blasting.

The shot-blasted surfaces in fuel oil tanks, lubricating oil tanks, diesel oil tanks and other oil tanks for machinery use shall also be applied with shop primer immediately after shot-blasting.

Inorganic zinc primer (NIPPE ZINKY 1000FZ,green) shall be used as shop primer and average dry film thickness shall be 15 microns.

Shop primer stipulated above shall not be mentioned in painting schedule hereinafter.

9. SURFACE PREPARATION BEFORE PAINTING (2/3)

1-2. Secondary surface preparation

1) Blast cleaning

1) The surface coated with dielectric shield paint around permanent anode : abrasive blast cleaning (sa 2.5)

2) The surface coated with pure epoxy glass flake paint for bow thruster tunnel : abrasive blast cleaning (sa 2.5)

3) Cargo hatch cover outside : sweep blast cleaning after container sockets installed.

2) Mechanical tool cleaning

1) All welds and all burned, abraded or rusted portions of all steelwork shall be cleaned by mechanical tools after fabrication and/or assemby of components and before painting and touched up with the following.

a) For manual butt welded joints of outside of the shell plating :
shop primer or anti-corrosive primer in addition to the specified painting schedule.

b) For damaged parts or bare spots except the abovementioned welded joints in shop primed surfaces or in the preceding coat :
paints in accordance with painting schedule hereinafter, but not with shop primer.

Disc sanders, power brushes and wire hand brushes shall be used as mechanical tools.

Slag, sputter, heat scale, rust, etc. shall be removed by wire brushes/disc sanders according to the builder's standard practice.

The grade of surface preparation shall be as follows:

Exposed surfaces including outfitting : CSt 3 of SIS

Surfaces in tanks coated with T/E or P/E : CSt 3 of SIS

Other surfaces : CSt 2 of SIS

9 SURFACE PREPARATION BEFORE PAINTING (3/3)

2. SURFACE PREPARATION FOR OUTFITTINGS :

Outfittings to be painted shall be cleaned by the following prior to painting.

1) Outfittings made from shop-primed steel material:

a) Outfittings coated with paint :
Power tool cleaning (St.3)

2) Outfittings made from non-primed steel material:

a) Outfittings coated with inorganic zinc paint:
Abrasive blast cleaning (Sa2.5)

b) Outfittings coated with pure epoxy , tar epoxy paint and chlorinated rubber paint :
Power tool cleaning (St.3)

c) Outfittings coated with oleoresinous paint :
Power tool cleaning (St.2)

Note:
(1) Outfittings which are to be coated with paints (except inorganic zinc) and oil wiping may be treated by pickling instead of abovementioned methods.

(2) Disc sander, power brushes and wire hand brushes shall be used as power tools.

3. Remarks

1) In general, the cleaned steel surfaces shall directly be applied with 1 st coat paint. However, if it is imposible to apply the 1 st coat paint immediately after the cleaning due to the construction schedule, etc., the shop-primer shall be touched up to the cleaned surfaces to prevent rusting.

2) Prior to painting, all grease, oil, dirt, dust, salts and similar foreign materials shall be removed by a process or processes approved by the paint manufacturer as being suitable for such purpose and as being compatible with the surface being cleaned and the next paint coat to be applied.

10. SHELL (1/3)

APPLICATION PART \ PAINTING SYSTEM				1ST COAT	2ND COAT	3RD COAT	4TH COAT	5TH COAT	FINAL COAT	T.D.F.T. (MICRONS)	
SHELL	BOTTOM ZONE	FLAT PART		T/E A/C BLACK (125 MIC.)	V/T BRONZE (75 MIC.)	V/T SILVER (50 MIC.)	SP A/F PINK (150 MIC.)	SP A/F PLUM * (150 MIC.)		550	10824
		SIDE SHELL INCLUDING BILGE STRAKE	AROUND PERMAN. ANODE	SEE OTHER DRAWING (DWG.NO.3106020 "IMPRESSED CURRENT CATHODIC PROTECTION SYSTEM)							
			OTHER	T/E A/C BLACK (125 MIC.)	V/T BRONZE (75 MIC.)	V/T SILVER (50 MIC.)	SP A/F PINK (150 MIC.)	SP A/F PLUM * (150 MIC.)		550	
	BILGE KEEL	OUTSIDE		DITTO	DITTO	DITTO	DITTO	DITTO			220
		INSIDE		B/S BLACK (40 MIC.)	PAINTING TO BE APPLIED BEFORE CLOSING OF COVER PLATE. NO TOUCH UP COAT TO BE APPLIED AFTER CLOSING.					40	150
	SEA CHEST	INSIDE		T/E A/C BLACK (125 MIC.)	V/T BRONZE (75 MIC.)	V/T SILVER (50 MIC.)	SP A/F PINK (150 MIC.)	SP A/F PLUM * (150 MIC.)		550	99
		PORTABLE GRATE (GALVD.)		DITTO	DITTO	DITTO	DITTO	DITTO			20
	BOW THRUSTER TUNNEL	MAKER FURNISHED PART	MILD STEEL PART	P/E GLASS FLAKE (500 MIC.) (PAINTED BY MAKER)	V/T SILVER (50 MIC.)	SP A/F PINK (150 MIC.)	SP A/F PLUM * (150 MIC.)			850	10
			STAIN-LESS CLAD PART	V/T SILVER (50 MIC.) (PAINTED BY MAKER)	SP A/F PINK (150 MIC.)	SP A/F PLUM * (150 MIC.)				350	
		BUILDER FURNISHED PART		P/E GLASS FLAKE (500 MIC.)	V/T SILVER (50 MIC.)	SP A/F PINK (150 MIC.)	SP A/F PLUM * (150 MIC.)	(SEE SKETCH ON PAGE 18)		850	21
		PORTABLE GRATE (SUS)		V/T SILVER (50 MIC.)	SP A/F PINK (150 MIC.)	SP A/F PLUM * (150 MIC.)				350	12
		THRUSTER CASING & BONNET		SEE PAGE 80							
	RUDDER	OUTSIDE		T/E A/C BLACK (125 MIC.)	V/T BRONZE (75 MIC.)	V/T SILVER (50 MIC.)	SP A/F PINK (150 MIC.)	SP A/F PLUM * (150 MIC.)		550	138
		INSIDE	PINTLE RECESS	DITTO						125	54
			OTHER	B/S BLACK (40 MIC.)	PAINTING TO BE APPLIED BEFORE CLOSING OF COVER PLATE. NO TOUCH UP COAT TO BE APPLIED AFTER CLOSING.					40	250

MITSUI ENGINEERING & SHIPBUILDING CO.,LTD.

10. SHELL (2/3)

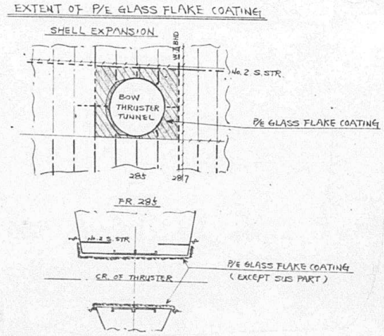
APPLICATION PART		PAINTING SYSTEM	1ST COAT	2ND COAT	3RD COAT	4TH COAT	FINAL COAT	T.D.F.T. (MICRONS)	
SHELL	RUDDER HORN	OUTSIDE	T/E A/C BLACK (125 MIC.)	V/T BRONZE (75 MIC.)	V/T SILVER (50 MIC.)	SP A/F PINK (150 MIC.)	SP A/F PLUM * (150 MIC.)	550	74
		INSIDE (VOID)	T/E BLACK (100 MIC.)					100	60
	RUDDER TRUNK	INSIDE	T/E A/C BLACK (125 MIC.)					125	78
	RUDDER STOCK	MACHINE FINISHED PART	NO PAINT						
		OTHER PART	SAME AS SURROUNDING SPACE						
	TOP SIDE ZONE		CHR BA/C LIGHT BROWN (40 MIC.)	CHR BA/C SILVER (40 MIC.)	CHR T/S BLACK (30 MIC.)	CHR T/S BLACK (30 MIC.)			3,956
	FOCSLE SHELL		DITTO	DITTO	DITTO	DITTO		140	872
	TUG BIT RECESS	INSIDE	DITTO	DITTO	DITTO	DITTO			20
		TUG BITTS	SEE PAGE 56						
	BOW CHOCK	OUTSIDE	CHR BA/C LIGHT BROWN (40 MIC.)	CHR BA/C SILVER (40 MIC.)	CHR F/P WHITE (30 MIC.)	CHR F/P WHITE (30 MIC.)		140	110
		INSIDE	CHR A/C DARK GRAY (40 MIC.)	CHR A/C LIGHT GRAY (40 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)			288
	SIDE PORT DOOR		SEE PAGE 61						
	DISTANCE PIECES FOR VALVE ATTACHED ON SEA CHEST & SHELL	OUTSIDE: 100 φ & OVER (STEEL)	SAME AS SURROUNDING SPACE						
		OUTSIDE: 90 φ & BELOW (GALVD)		DITTO					
		INSIDE: 100 φ & OVER (STEEL)	SAME AS SHELL PLATE & SEA CHEST						
		INSIDE: 90 φ & BELOW (GALVD)	NO PAINT						

MITSUI ENGINEERING & SHIPBUILDING CO.,LTD.

10. SHELL (3/3)

APPLICATION PART / PAINTING SYSTEM	1ST COAT	2ND COAT	3RD COAT	4TH COAT	FINAL COAT	T.D.F.T. (MICRONS)

EXTENT OF P/E GLASS FLAKE COATING



NOTE:
1. GENERALLY, FINAL COAT OF SP A/F MARKED WITH * SHALL BE APPLIED IN DRY DOCK JUST PRIOR TO THE SEA TRIAL.
2. THE BOTTOM SURFACE ABOVE THE SUPPORTING BLOCKS SHALL NOT BE TOUCHED UP AT THE FINAL DOCKING BEFORE DELIVERY OF THE VESSEL BUT TWO (2) COATS OF SP A/F SHALL BE APPLIED BEFORE LAUNCHING.
3. FRESH WATER CLEANING SHALL ONLY APPLIED TO OUTSIDE SHELL AT FINAL DRY DOCKING BEFORE THE DELIVERY OF THE VESSEL.
4. FOR THE REQUIRED FILM THICKNESS OF THE ANTI-FOULING SYSTEM STIPULATED ABOVE, PLEASE REFER TO ITEM 6-1) OF PAGE 5 IN THIS DRAWING.

MITSUI ENGINEERING & SHIPBUILDING CO.,LTD.

11. EXPOSED WEATHER DECK

APPLICATION PART		PAINTING SYSTEM	1ST COAT	2ND COAT	3RD COAT	4TH COAT	FINAL COAT	T.D.F.T. (MICRONS)	
EXPOSED WEATHER DECK	HOUSE TOP (07)	STEEL	CHR A/C DARK GRAY (40 MIC.)	CHR A/C LIGHT GRAY (40 MIC.)	CHR D/P NON-SKID STORM GRAY (30 MIC.)			110	134
	NAV. BRIDGE DECK (06)	STEEL (INCLUDING UNDER RUBBER MAT)	DITTO	DITTO	DITTO				278
		RUBBER MAT	NO PAINT						
	SR. OFFICER'S DECK (05), PASSENGER DECK (04), BOAT DECK (03), CREW DECK (02)	STEEL	CHR A/C DARK GRAY (40 MIC.)	CHR A/C LIGHT GRAY (40 MIC.)	CHR D/P NON-SKID STORM GRAY (30 MIC.)			110	170
	FOCSLE DECK	DECK UNDER WINDLASS & DECK ENCLOSED BY GUTTER BAR	T/E HB BLACK (200 MIC.)					200	48
		OTHER	CHR A/C DARK GRAY (40 MIC.)	CHR A/C LIGHT GRAY (40 MIC.)	CHR D/P NON-SKID STORM GRAY (30 MIC.)			110	548
	UPPER DECK	DECK UNDER WINDLASS & DECK ENCLOSED BY GUTTER BAR	T/E HB BLACK (200 MIC.)					200	44
		OTHER	CHR A/C DARK GRAY (40 MIC.)	CHR A/C LIGHT GRAY (40 MIC.)	CHR D/P NON-SKID STORM GRAY (30 MIC.)			110	3799
	TOP DECK OF ENGINE CASING	INCLUDING 5.2M LEVEL DECK	DITTO	DITTO	DITTO				176

MITSUI ENGINEERING & SHIPBUILDING CO.,LTD.

12. DECK HOUSE EXTERIOR (1/2)

APPLICATION PART		PAINTING SYSTEM		1ST COAT	2ND COAT	3RD COAT	4TH COAT	FINAL COAT	T.D.F.T. (MICRONS)	
DECK HOUSE EXTERIOR	EXTERIOR OF ACCOMM. DECK HOUSE	HOUSE TOP (07) ~ FOCSLE DECK		CHR A/C DARK GRAY (40 MIC.)	CHR A/C LIGHT GRAY (40 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)			1,294
	FOCSLE AFT WALL	FOCSLE DECK ~ UPPER DECK		DITTO	DITTO	DITTO	DITTO			190
	EXTERIOR OF ENGINE CASING HOUSE	STEEL		DITTO	DITTO	DITTO	DITTO		140	482
	UNDERSURFACE OF OVERHANG DECK	STEEL		DITTO	DITTO	DITTO	DITTO			550
	BULWARK	ON NAV. BR. DECK (06) (INCLUD. WIND DEFLECTOR)	OUTSIDE	DITTO	DITTO	DITTO	DITTO			70
			INSIDE	DITTO	DITTO	DITTO	DITTO			76
		ON FOCSLE SHELL AFT	OUTSIDE	SAME AS FOCSLE SHELL						
			INSIDE	CHR A/C DARK GRAY (40 MIC.)	CHR A/C LIGHT GRAY (40 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)			26
	EXTERIOR OF DECK COMPANION	TOP DECK & WALL	FR. 7-81/2.	DITTO	DITTO	DITTO	DITTO		140	60
	EXTERIOR OF FAN HOUSE (2)	TOP DECK & WALL	FR. 84-87 & 103-106	DITTO	DITTO	DITTO	DITTO			548

MITSUI ENGINEERING & SHIPBUILDING CO.,LTD.

ATTENTION!

FILM NO. 934 (THE LAST FILM)
IS WRONG.

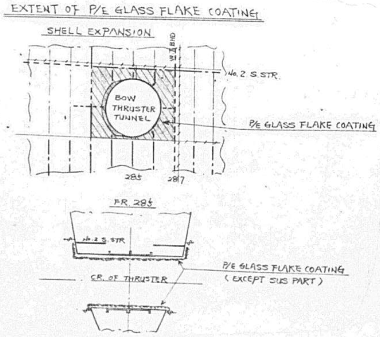
10. SHELL (2/3)

APPLICATION PART		PAINTING SYSTEM	1ST COAT	2ND COAT	3RD COAT	4TH COAT	FINAL COAT	T.D.F.T. (MICRONS)	
SHELL	RUDDER HORN	OUTSIDE	T/E A/C BLACK (125 MIC.)	V/T BRONZE (75 MIC.)	V/T SILVER (50 MIC.)	SP A/F PINK (150 MIC.)	SP A/F PLUM * (150 MIC.)	550	74
		INSIDE (VOID)	T/E BLACK (100 MIC.)					100	60
	RUDDER TRUNK	INSIDE	T/E A/C BLACK (125 MIC.)					125	78
	RUDDER STOCK	MACHINE FINISHED PART	NO PAINT						
		OTHER PART	SAME AS SURROUNDING SPACE						
	TOP SIDE ZONE		CHR BA/C LIGHT BROWN (40 MIC.)	CHR BA/C SILVER (40 MIC.)	CHR T/S BLACK (30 MIC.)	CHR T/S BLACK (30 MIC.)			3,956
	FOCSLE SHELL		DITTO	DITTO	DITTO	DITTO		140	872
	TUG BIT RECESS	INSIDE	DITTO	DITTO	DITTO	DITTO			20
		TUG BITTS	SEE PAGE 56						
	BOW CHOCK	OUTSIDE	CHR BA/C LIGHT BROWN (40 MIC.)	CHR BA/C SILVER (40 MIC.)	CHR F/P WHITE (30 MIC.)	CHR F/P WHITE (30 MIC.)		140	110
		INSIDE	CHR A/C DARK GRAY (40 MIC.)	CHR A/C LIGHT GRAY (40 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)			288
	SIDE PORT DOOR		SEE PAGE 61						
	DISTANCE PIECES FOR VALVE ATTACHED ON SEA CHEST & SHELL	OUTSIDE: 100 ϕ & OVER (STEEL)	SAME AS SURROUNDING SPACE						
		OUTSIDE: 90 ϕ & BELOW (GALVD)		DITTO					
		INSIDE: 100 ϕ & OVER (STEEL)	SAME AS SHELL PLATE & SEA CHEST						
		INSIDE: 90 ϕ & BELOW (GALVD)	NO PAINT						

10. SHELL (3/3)

APPLICATION PART / PAINTING SYSTEM	1ST COAT	2ND COAT	3RD COAT	4TH COAT	FINAL COAT	T.D.F.T. (MICRONS)

EXTENT OF P/E GLASS FLAKE COATING



NOTE:

1. GENERALLY, FINAL COAT OF SP A/F MARKED WITH * SHALL BE APPLIED IN DRY DOCK JUST PRIOR TO THE SEA TRIAL.
2. THE BOTTOM SURFACE ABOVE THE SUPPORTING BLOCKS SHALL NOT BE TOUCHED UP AT THE FINAL DOCKING BEFORE DELIVERY OF THE VESSEL BUT TWO (2) COATS OF SP A/F SHALL BE APPLIED BEFORE LAUNCHING.
3. FRESH WATER CLEANING SHALL ONLY APPLIED TO OUTSIDE SHELL AT. FINAL DRY DOCKING BEFORE THE DELIVERY OF THE VESSEL.
4. FOR THE REQUIRED FILM THICKNESS OF THE ANTI-FOULING SYSTEM STIPULATED ABOVE, PLEASE REFER TO ITEM 6-1) OF PAGE 5 IN THIS DRAWING.

11. EXPOSED WEATHER DECK

APPLICATION PART		PAINTING SYSTEM	1ST COAT	2ND COAT	3RD COAT	4TH COAT	FINAL COAT	T.D.F.T. (MICRONS)	
EXPOSED WEATHER DECK	HOUSE TOP (07)	STEEL	CHR A/C DARK GRAY (40 MIC.)	CHR A/C LIGHT GRAY (40 MIC.)	CHR D/P NON-SKID STORM GRAY (30 MIC.)			110	134
	NAV. BRIDGE DECK (06)	STEEL (INCLUDING UNDER RUBBER MAT)	DITTO	DITTO	DITTO				278
		RUBBER MAT	NO PAINT						
	SR. OFFICER'S DECK (05), PASSENGER DECK (04), BOAT DECK (03), CREW DECK (02)	STEEL	CHR A/C DARK GRAY (40 MIC.)	CHR A/C LIGHT GRAY (40 MIC.)	CHR D/P NON-SKID STORM GRAY (30 MIC.)			110	170
	FOCSLE DECK	DECK UNDER WINDLASS & DECK ENCLOSED BY GUTTER BAR	T/E HB BLACK (200 MIC.)					200	48
		OTHER	CHR A/C DARK GRAY (40 MIC.)	CHR A/C LIGHT GRAY (40 MIC.)	CHR D/P NON-SKID STORM GRAY (30 MIC.)			110	548
	UPPER DECK	DECK UNDER WINDLASS & DECK ENCLOSED BY GUTTER BAR	T/E HB BLACK (200 MIC.)					200	44
		OTHER	CHR A/C DARK GRAY (40 MIC.)	CHR A/C LIGHT GRAY (40 MIC.)	CHR D/P NON-SKID STORM GRAY (30 MIC.)			110	3799
	TOP DECK OF ENGINE CASING	INCLUDING 5.2M LEVEL DECK	DITTO	DITTO	DITTO				176

12. DECK HOUSE EXTERIOR (1/2)

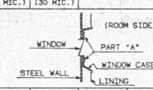
APPLICATION PART		PAINTING SYSTEM		1ST COAT	2ND COAT	3RD COAT	4TH COAT	FINAL COAT	T.D.F.T. (MICRONS)	
DECK HOUSE EXTERIOR	EXTERIOR OF ACCOMM. DECK HOUSE	HOUSE TOP (07) ∫ FOCSLE DECK		CHR A/C DARK GRAY (40 MIC.)	CHR A/C LIGHT GRAY (40 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)			1,294
	FOCSLE AFT WALL	FOCSLE DECK ∫ UPPER DECK		DITTO	DITTO	DITTO	DITTO			190
	EXTERIOR OF ENGINE CASING HOUSE	STEEL		DITTO	DITTO	DITTO	DITTO		140	482
	UNDERSURFACE OF OVERHANG DECK	STEEL		DITTO	DITTO	DITTO	DITTO			550
	BULWARK	ON NAV. BR. DECK (06) (INCLUD. WIND DEFLECTOR)	OUTSIDE	DITTO	DITTO	DITTO	DITTO			70
			INSIDE	DITTO	DITTO	DITTO	DITTO			76
		ON FOCSLE SHELL AFT	OUTSIDE	SAME AS FOCSLE SHELL						
			INSIDE	CHR A/C DARK GRAY (40 MIC.)	CHR A/C LIGHT GRAY (40 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)			26
	EXTERIOR OF DECK COMPANION	TOP DECK & WALL	FR. 7-81/2.	DITTO	DITTO	DITTO	DITTO		140	60
	EXTERIOR OF FAN HOUSE (2)	TOP DECK & WALL	FR. 84-87 & 103-106	DITTO	DITTO	DITTO	DITTO			548

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12. DECK HOUSE EXTERIOR (2/2)

APPLICATION PART			PAINTING SYSTEM	1ST COAT	2ND COAT	3RD COAT	4TH COAT	FINAL COAT	T.D.F.T. (MICRONS)	
DECK HOUSE EXTERIOR	FUNNEL	OUTSIDE	UPPER PART	CHR A/C DARK GRAY (40 MIC.)	CHR A/C LIGHT GRAY (40 MIC.)	CHR F/P BLACK (30 MIC.)	CHR F/P BLACK (30 MIC.)	CHR F/P APL BLUE	140	31
			MIDDLE PART	DITTO	DITTO	CHR F/P WHITE (30 MIC.)	CHR F/P WHITE (30 MIC.)	CHR F/P APL RED		30
			LOWER PART	DITTO	DITTO	CHR F/P BLACK (30 MIC.)	CHR F/P BLACK (30 MIC.)	CHR F/P APL BLUE		64
		INSIDE	STEEL	C.A/C LIGHT GRAY (35 MIC.)	H/R A/P SILVER (20 MIC.)				55	232
		TOP COVER PLATE	UPPER SURFACE	CHR A/C DARK GRAY (40 MIC.)	CHR A/C LIGHT GRAY (40 MIC.)	CHR F/P BLACK (30 MIC.)	CHR F/P BLACK (30 MIC.)	CHR F/P APL BLUE	140	11
			UNDER SURFACE	C.A/C LIGHT GRAY (35 MIC.)	H/R A/P SILVER (20 MIC.)				55	16
		SAMPAN	OUTSIDE	CHR A/C DARK GRAY (40 MIC.)	CHR A/C LIGHT GRAY (40 MIC.)	CHR F/P BLACK (30 MIC.)	CHR F/P BLACK (30 MIC.)	CHR F/P APL BLUE	140	34
			INSIDE	C.A/C LIGHT GRAY (35 MIC.)	H/R A/P SILVER (20 MIC.)				55	48
		STACK INSIGNIA	DIAMOND	SAME AS OUTSIDE				CHR F/P DARK BLUE (30 MIC.)		
			LETTER "L"	DITTO				CHR F/P WHITE (30 MIC.)		
		EAGLE MARK		SAME AS OUTSIDE				CHR F/P WHITE		6

13. ACCOMMODATION SPACE (1/16)

APPLICATION PART		PAINTING SYSTEM	1ST COAT	2ND COAT	3RD COAT	4TH COAT	FINAL COAT	T.D.F.T. (MICRONS)	
GENERAL	CEILING AND WALL	STEEL SURFACE BEHIND LINING, CEILING & INSULATION	SEE PAINTING SCHEDULE DESCRIBED BELOW						
		CEILING, LINING & BARE STEEL SURFACES	DITTO						
		HANGER & JOIST FOR PANEL (GALVD.)	NO PAINT						
	FLOOR	STEEL SURFACE BEHIND DECK COMPOSITON & CEMENT	DITTO						
		DCEK COVERING & BARE STEEL SURFACES	SEE PAINTING SCHEDULE DESCRIBED BELOW						
		GUTTER WAY (STEEL)	T/E HB BLACK (200 MIC.)					200	262
	STEEL WALL IN WAY OF CIRCLE OR SQUARE WINDOW	WINDOW CASE (STEEL)	NO PAINT (BAKED FINISH)						
		PART "A" (BARE STEEL)	C.A/C LIGHT GRAY (35 MIC.)	C.WHITE A/C (35 MIC.)	C.F/P WHITE (30 MIC.)			100	84
									
IN NAV.BRIDGE DECK HOUSE (06)	STEEL SURFACE BEHIND LINING, CEILING & INSULATION	CEILING	C.A/C LIGHT GRAY (35 MIC.)					35	212
		WALL – STEEL SURFACE EXPOSED TO WEATHER – BEHIND INSULAT.	DITTO						154
		WALL – STEEL SURFACE EXPOSED TO WEATHER – BEHIND MODULAR LINING PANEL	T/E HB BLACK (200 MIC.)					200	6
		WALL – STEEL SURFACE NOT EXPOSED TO WEATHER	C.A/C LIGHT GRAY (35 MIC.)					35	104

13. ACCOMMODATION SPACE (2/16)

APPLICATION PART		PAINTING SYSTEM		1ST COAT	2ND COAT	3RD COAT	4TH COAT	FINAL COAT	T.D.F.T. (MICRONS)	
IN NAV.BRIDGE DECK HOUSE (06)	WHEEL HOUSE, STAIRWAY COMPANION, W.C.	CEILING	MODULAR PANEL	PVC LAMINATED						
		WALL	MODULAR PANEL	DITTO						
		FLOOR	VINYL TILE & MOSAIC TILE	NO PAINT						
	SERVICE LOCKER (B)	CEILING	COLORED GALVD. SHEET	(PREPAINTED BY SUBCONTRACTOR, FINISHING COLOR: WHITE)						
		WALL	COLORED GALVD. SHEET		DITTO					
			BARE STEEL	C.A/C LIGHT GRAY (35 MIC.)	C.WHITE A/C (35 MIC.)	C.F/P WHITE (30 MIC.)			100	16
		FLOOR	MOSAIC TILE	NO PAINT						
	BATTERY ROOM	CEILING	COLORED GALVD. SHEET	(PREPAINTED BY SUBCONTRACTOR, FINISHING COLOR: WHITE)						
		WALL	COLORED GALVD. SHEET		DITTO					
			BARE STEEL	P/E A/C GRAY (70 MIC.)	P/E F/P WHITE (70 MIC.)	P/E F/P WHITE (70 MIC.)			210	9
		FLOOR	BARE STEEL	T/E RED BROWN (100 MIC.)	T/E BLACK (100 MIC.)				200	5
	ELECTRIC ROOM, DECK CHAIRS ROOM	CEILING	COLORED GALVD. SHEET	(PREPAINTED BY SUBCONTRACTOR, FINISHING COLOR: WHITE)						
		WALL	COLORED GALVD. SHEET		DITTO					
			BARE STEEL	C.A/C LIGHT GRAY (35 MIC.)	C.WHITE A/C (35 MIC.)	C.F/P WHITE (30 MIC.)			100	26
		FLOOR	BARE STEEL	DITTO	C.D/P STORM GRAY (35 MIC.)				70	15

13. ACCOMMODATION SPACE (3/16)

APPLICATION PART		PAINTING SYSTEM		1ST COAT	2ND COAT	3RD COAT	4TH COAT	FINAL COAT	T.D.F.T. (MICRONS)	
IN NAV.BRIDGE DECK HOUSE (06)	ELEVATOR SHEAVE ROOM	CEILING	COLORED GALVD. SHEET	(PREPAINTED BY SUBCONTRACTOR, FINISHING COLOR: WHITE)						
		WALL	BARE STEEL	C.A/C LIGHT GRAY (35 MIC.)	C.WHITE A/C (35 MIC.)	C.F/P WHITE (30 MIC.)			100	25
		FLOOR	BARE STEEL	DITTO	C.D/P STORM GRAY (35 MIC.)				70	4
IN SR.OFFICER'S DECK HOUSE (05)	STEEL SURFACE BEHIND LINING, CEILING & INSULATION	CEILING		C.A/C LIGHT GRAY (35 MIC.)					35	598
		WALL – STEEL SURFACE EXPOSED TO WEATHER	BEHIND INSULAT.	DITTO						84
		WALL – STEEL SURFACE EXPOSED TO WEATHER	BEHIND MODULAR LINING PANEL	T/E HB BLACK (200 MIC.)					200	246
		WALL – STEEL SURFACE NOT EXPOSED TO WEATHER		C.A/C LIGHT GRAY (35 MIC.)					35	530
	PUBLIC ROOM, PRIVATE ROOMS, PASSAGEWAY, STAIRWAY COMPANION, OFFICE ROOM, RADIO ROOM, COMPUTER RM., CLOSET FOR OFFICE, ALL LAVATORY	CEILING	MODULAR PANEL	PVC LAMINATED						
		WALL	MODULAR PANEL	DITTO						
		FLOOR	VINYL TILE & MOSAIC TILE	NO PAINT						
	LAUNDRY	CEILING	STAINL. STEEL SHEET	DITTO						
		WALL	STAINL. STEEL SHEET	DITTO						
		FLOOR	MOSAIC TILE	DITTO						

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13. ACCOMMODATION SPACE (4/16)

APPLICATION PART		PAINTING SYSTEM		1ST COAT	2ND COAT	3RD COAT	4TH COAT	FINAL COAT	T.D.F.T. (MICRONS)	
IN SR.OFFICER'S DECK HOUSE (05)	SERVICE LOCKER (A)	CEILING	COLORED GALVD. SHEET	(PREPAINTED BY SUBCONTRACTOR, FINISHING COLOR:WHITE)						
		WALL	BARE STEEL	C.A/C LIGHT GRAY (35 MIC.)	C.WHITE A/C (35 MIC.)	C.F/P WHITE (30 MIC.)			100	30
		FLOOR	MOSAIC TILE	NO PAINT						
	BAGG. LOCKER	CEILING	COLORED GALVD. SHEET	(PREPAINTED BY SUBCONTRACTOR, FINISHING COLOR:WHITE)						
		WALL	COLORED GALVD. SHEET		DITTO					
			BARE STEEL	C.A/C LIGHT GRAY (35 MIC.)	C.WHITE A/C (35 MIC.)	C.F/P WHITE (30 MIC.)			100	18
		FLOOR	BARE STEEL	DITTO	C.D/P STORM GRAY (35 MIC.)				70	3
	DUCT TRUNK, PIPE & ELECT. CABLE TRUNK	INSIDE	BARE STEEL	DITTO	C.A/C LIGHT GRAY (35 MIC.)					57
	ELEV.TRUNK	INSIDE		SEE PAGE 36						
IN PASSENGER DECK HOUSE (04)	STEEL SURFACE BEHIND LINING, CEILING & INSULATION	CEILING		C.A/C LIGHT GRAY (35 MIC.)					35	582
		WALL: STEEL SURFACE EXPOSED TO WEATHER	BEHIND INSULAT.	DITTO						98
			BEHIND MODULAR LINING PANEL	T/E HB BLACK (200 MIC.)					200	226
		STEEL SURFACE NOT EXPOSED TO WEATHER		C.A/C LIGHT GRAY (35 MIC.)					35	512

13. ACCOMMODATION SPACE (5/16)

APPLICATION PART		PAINTING SYSTEM		1ST COAT	2ND COAT	3RD COAT	4TH COAT	FINAL COAT	T.D.F.T. (MICRONS)	
IN PASSENGER DECK HOUSE (04)	PUBLIC ROOM, PRIVATE ROOMS, PASSAGEWAY, STAIRWAY COMPANION, PASSENGER LOUNGE, ALL LAVATORY	CEILING	MODULAR PANEL	PVC LAMINATED						
		WALL	MODULAR PANEL	DITTO						
		FLOOR	VINYL TILE & MOSAIC TILE	NO PAINT						
	LAUNDRY	CEILING	STAINL. STEEL SHEET	DITTO						
		WALL	STAINL. STEEL SHEET	DITTO						
		FLOOR	MOSAIC TILE	DITTO						
	SPARE BULB LOCKER, BAGG. LOCKER (S)	CEILING	BARE STEEL	C.A/C LIGHT GRAY (35 MIC.)	C.WHITE A/C (35 MIC.)	C.F/P WHITE (30 MIC.)			100	14
		WALL	COLORED GALVD. SHEET	(PREPAINTED BY SUBCONTRACTOR, FINISHING COLOR:WHITE)						
			BARE STEEL	C.A/C LIGHT GRAY (35 MIC.)	C.WHITE A/C (35 MIC.)	C.F/P WHITE (30 MIC.)			100	44
		FLOOR	BARE STEEL	DITTO	C.D/P STORM GRAY (35 MIC.)				70	4
	SERVICE LOCKER	CEILING	COLORED GALVD. SHEET	(PREPAINTED BY SUBCONTRACTOR, FINISHING COLOR:WHITE)						
		WALL	BARE STEEL	C.A/C LIGHT GRAY (35 MIC.)	C.WHITE A/C (35 MIC.)	C.F/P WHITE (30 MIC.)			100	36
		FLOOR	CERAMIC TILE	NO PAINT						
	BAGG. LOCKER, DECK CHAIRS ROOM	CEILING	BARE STEEL	C.A/C LIGHT GRAY (35 MIC.)	C.WHITE A/C (35 MIC.)	C.F/P WHITE (30 MIC.)			100	8
		WALL	BARE STEEL	DITTO	DITTO	DITTO				44
		FLOOR	BARE STEEL	DITTO	C.D/P STORM GRAY (35 MIC.)				70	10

13. ACCOMMODATION SPACE (6/16)

APPLICATION PART		PAINTING SYSTEM		1ST COAT	2ND COAT	3RD COAT	4TH COAT	FINAL COAT	T.D.F.T. (MICRONS)	
IN PASSENGER DECK HOUSE (04)	GAME EQUIP. CLOSET	CEILING	MODULAR PANEL	PVC LAMINATED						
		WALL	MODULAR PANEL	DITTO						
			BARE STEEL	C.A/C LIGHT GRAY (35 MIC.)	C.WHITE A/C (35 MIC.)	C.F/P WHITE (30 MIC.)			100	12
		FLOOR	BARE STEEL	DITTO	C.D/P STORM GRAY (35 MIC.)				70	3
	DUCT TRUNK, PIPE &ELECT. CABLE TRUNK	INSIDE	BARE STEEL	DITTO	C.A/C LIGHT GRAY (35 MIC.)					52
	ELEV.TRUNK	INSIDE		SEE PAGE 36						
IN BOAT DECK HOUSE (03)	STEEL SURFACE BEHIND LINING, CEILING & INSULATION	CEILING		C.A/C LIGHT GRAY (35 MIC.)					35	613
		WALL: STEEL SURFACE EXPOSED TO WEATHER	BEHIND INSULAT.	DITTO						70
			BEHIND MODULAR LINING PANEL	T/E HB BLACK (200 MIC.)					200	242
		STEEL SURFACE NOT EXPOSED TO WEATHER		C.A/C LIGHT GRAY (35 MIC.)					35	447
	REC.ROOM, PUBLIC ROOMS, PRIVATE ROOMS, PASSAGEWAY, STAIRWAY COMPANION, ALL LAVATORY	CEILING	MODULAR PANEL	PVC LAMINATED						
		WALL	MODULAR PANEL	DITTO						
		FLOOR	VINYL TILE & MOSAIC TILE	NO PAINT						

13. ACCOMMODATION SPACE (7/16)

APPLICATION PART		PAINTING SYSTEM		1ST COAT	2ND COAT	3RD COAT	4TH COAT	FINAL COAT	T.D.F.T. (MICRONS)	
IN BOAT DECK HOUSE (03)	CLOSET	CEILING	MODULAR PANEL	PVC LAMINATED						
		WALL	MODULAR PANEL	DITTO						
		FLOOR	BARE STEEL	C.A/C LIGHT GRAY (35 MIC.)	C.D/P STORM GRAY (35 MIC.)				70	4
	SERVICE LOCKER (A)	CEILING	BARE STEEL	DITTO	C.WHITE A/C (35 MIC.)	C.F/P WHITE (30 MIC.)				4
		WALL	BARE STEEL	DITTO	DITTO	DITTO			100	28
		FLOOR	MOSAIC TILE	NO PAINT						
	BAGG. LOCKER	CEILING	BARE STEEL	C.A/C LIGHT GRAY (35 MIC.)	C.WHITE A/C (35 MIC.)	C.F/P WHITE (30 MIC.)			100	5
		WALL	BARE STEEL	DITTO	DITTO	DITTO				26
		FLOOR	BARE STEEL	DITTO	C.D/P STORM GRAY (35 MIC.)				70	4
	DUCT TRUNK(3), PIPE & ELECT. CABLE TRUNK	INSIDE	BARE STEEL	DITTO	C.A/C LIGHT GRAY (35 MIC.)					49
	ELEV.TRUNK	INSIDE		SEE PAGE 36						
IN CREW DECK HOUSE (02)	STEEL SURFACE BEHIND LINING, CEILING & INSULATION	CEILING		C.A/C LIGHT GRAY (35 MIC.)					35	606
		WALL: STEEL SURFACE EXPOSED TO WEATHER	BEHIND INSULAT.	DITTO						73
			BEHIND MODULAR LINING PANEL	T/E HB BLACK (200 MIC.)					200	257
		STEEL SURFACE NOT EXPOSED TO WEATHER		C.A/C LIGHT GRAY (35 MIC.)					35	513

13. ACCOMMODATION SPACE (8/16)

APPLICATION PART		PAINTING SYSTEM		1ST COAT	2ND COAT	3RD COAT	4TH COAT	FINAL COAT	T.D.F.T. (MICRONS)	
IN CREW DECK HOUSE (02)	PUBLIC ROOMS, PRIVATE ROOMS, PASSAGEWAY, STAIRWAY COMPANION, ALL LAVATORY	CEILING	MODULAR PANEL	PVC LAMINATED						
		WALL	MODULAR PANEL	DITTO						
		FLOOR	VINYL TILE & MOSAIC TILE	NO PAINT						
	LAUNDRY	CEILING	STAINL. STEEL SHEET	DITTO						
		WALL	STAINL. STEEL SHEET	DITTO						
		FLOOR	MOSAIC TILE	DITTO						
	CLOSET	CEILING	MODULAR PANEL	PVC LAMINATED						
		WALL	MODULAR PANEL	DITTO						
		FLOOR	BARE STEEL	C.A/C LIGHT GRAY (35 MIC.)	C.D/P STORM GRAY (35 MIC.)				70	4
	SERVICE LOCKER (A)	CEILING	BARE STEEL	DITTO	C.WHITE A/C (35 MIC.)	C.F/P WHITE (30 MIC.)			100	6
		WALL	BARE STEEL	DITTO	DITTO	DITTO				26
		FLOOR	MOSAIC TILE	NO PAINT						
	BAGG. LOCKER	CEILING	BARE STEEL	C.A/C LIGHT GRAY (35 MIC.)	C.WHITE A/C (35 MIC.)	C.F/P WHITE (30 MIC.)			100	6
		WALL	BARE STEEL	DITTO	DITTO	DITTO				26
		FLOOR	BARE STEEL	DITTO	C.D/P STORM GRAY (35 MIC.)				70	4

13. ACCOMMODATION SPACE (9/16)

APPLICATION PART		PAINTING SYSTEM		1ST COAT	2ND COAT	3RD COAT	4TH COAT	FINAL COAT	T.D.F.T. (MICRONS)	
IN CREW DECK HOUSE (02)	DUCT TRUNK(3), PIPE & ELECT. CABLE TRUNK	INSIDE	BARE STEEL	C.A/C LIGHT GRAY (35 MIC.)	C.A/C LIGHT GRAY (35 MIC.)				70	69
	ELEV. TRUNK	INSIDE		SEE PAGE 36						
	STEEL SURFACE BEHIND LINING, CEILING & INSULATION	CEILING		C.A/C LIGHT GRAY (35 MIC.)					35	66
		WALL — STEEL SURFACE EXPOSED TO WEATHER	BEHIND INSULAT.	DITTO						71
			BEHIND MODULAR LINING PANEL	T/E HB BLACK (200 MIC.)					200	249
		STEEL SURFACE NOT EXPOSED TO WEATHER		C.A/C LIGHT GRAY (35 MIC.)					35	650
IN SALOON DECK HOUSE (01)	PUBLIC ROOMS, PRIVATE ROOMS, HOSPITAL, OFFICES, PASSAGEWAY, STAIRWAY COMPANION, ALL LAVATORY, HOSPITAL BATH, W.C.	CEILING	MODULAR PANEL	PVC LAMINATED						
		WALL	MODULAR PANEL	DITTO						
		FLOOR	VINYL TILE & MOSAIC TILE	NO PAINT						
	GALLEY, OFFR'S PANTORY, CREW'S PANTORY	CEILING	STAINL. STEEL SHEET	DITTO						
		WALL	STAINL. STEEL SHEET	DITTO						
		FLOOR	GROOVE TILE	DITTO						

13. ACCOMMODATION SPACE (10/16)

APPLICATION PART		PAINTING SYSTEM		1ST COAT	2ND COAT	3RD COAT	4TH COAT	FINAL COAT	T.D.F.T. (MICRONS)	
IN SALOON DECK HOUSE (01)	SPACE (FR.283 1/2 -287,S)	CEILING	COLORED GALVD. SHEET	(PREPAINTED BY SUBCONTRACTOR, FINISHING COLOR:WHITE)						
		WALL	COLORED GALVD. SHEET		DITTO					
			BARE STEEL	C.A/C LIGHT GRAY (35 MIC.)	C.WHITE A/C (35 MIC.)	C.F/P WHITE (30 MIC.)			100	18
		FLOOR	BARE STEEL	DITTO	C.D/P STORM GRAY (35 MIC.)				70	9
	SERVICE LOCKER (A)	CEILING	BARE STEEL	DITTO	C.WHITE A/C (35 MIC.)	C.F/P WHITE (30 MIC.)			100	6
		WALL	BARE STEEL	DITTO	DITTO	DITTO				26
		FLOOR	MOSAIC TILE	NO PAINT						
	GAMES	CEILING	BARE STEEL	C.A/C LIGHT GRAY (35 MIC.)	C.WHITE A/C (35 MIC.)	C.F/P WHITE (30 MIC.)			100	2
		WALL	BARE STEEL	DITTO	DITTO	DITTO				11
			MODULAR PANEL	PVC LAMINATED						
		FLOOR	BARE STEEL	C.A/C LIGHT GRAY (35 MIC.)	C.D/P STORM GRAY (35 MIC.)				70	1
	DUCT TRUNK(3), PIPE & ELECT. CABLE TRUNK	INSIDE	BARE STEEL	DITTO	C.A/C LIGHT GRAY (35 MIC.)					47
	GARBAGE CHUTE	INSIDE	BARE STEEL	P/E A/C FWT CREAM (70 MIC.)	P/E F/P FWT WHITE (70 MIC.)	P/E F/P FWT BLUE (70 MIC.)			210	7
	ELEV. TRUNK	INSIDE		SEE PAGE 36						
	DUMB-WAITER	INSIDE		SEE PAGE 34						

13. ACCOMMODATION SPACE (11/16)

APPLICATION PART		PAINTING SYSTEM		1ST COAT	2ND COAT	3RD COAT	4TH COAT	FINAL COAT	T.D.F.T. (MICRONS)	
IN UPPER DECK	STEEL SURFACE BEHIND LINING, CEILING & INSULATION	BEHIND INSULATION IN COLD PROV. STORE	CEILING, WALL & FLOOR	T/E HB BLACK (200 MIC.)					200	302
	FOR OTHER ROOM	CEILING		C.A/C LIGHT GRAY (35 MIC.)					35	531
		WALL — STEEL SURFACE EXPOSED TO WEATHER	BEHIND INSULAT.	DITTO						87
			BEHIND MODULAR LINING PANEL	T/E HB BLACK (200 MIC.)					200	138
		STEEL SURFACE NOT EXPOSED TO WEATHER		C.A/C LIGHT GRAY (35 MIC.)					35	1009
	HOBBY ROOM, SLOP CHEST, SUEZ CANAL CREW, CONF. ROOM, ARCHIVES ROOM, ENG. OFFICE, BALL. CONF. ROOM &CARGO OFFICE, DECK OFFICE	CEILING	MODULAR PANEL	PVC LAMINATED						
		WALL	MODULAR PANEL	DITTO						
		FLOOR	VINYL TILE & MOSAIC TILE	NO PAINT						
	GYMNASIUM, PASSAGE WAY (FR.269 - 287), STAIRWAY COMPANION, LAVATORY, W.C., DECK CHANGE RM.	CEILING	MODULAR PANEL	PVC LAMINATED						
		WALL	MODULAR PANEL	DITTO						
		FLOOR	VINYL TILE & MOSAIC TILE	NO PAINT						
	OIL SKIN LOCKER	CEILING	BARE STEEL	C.A/C LIGHT GRAY (35 MIC.)	C.WHITE A/C (35 MIC.)	C.F/P WHITE (30 MIC.)			100	5
		WALL	BARE STEEL	DITTO	DITTO	DITTO				12
			COLORED GALVD. SHEET	(PREPAINTED BY SUBCONTRACTOR, FINISHING COLOR:WHITE)						
		FLOOR	DECK COMPOS.	NO PAINT						

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13. ACCOMMODATION SPACE (12/16)

	APPLICATION PART	PAINTING SYSTEM		1ST COAT	2ND COAT	3RD COAT	4TH COAT	FINAL COAT	T.D.F.T. (MICRONS)	
IN UPPER DECK	COLD PROVISION STORE	CEILING	STAINL. STEEL SHEET	NO PAINT						
		WALL	STAINL. STEEL SHEET	DITTO						
		FLOOR	TILE	DITTO						
	SERVICE LOCKER(B), WATCHMAN'S STATION, DECK STORE (P)	CEILING	BARE STEEL	C.A/C LIGHT GRAY (35 MIC.)	C.WHITE A/C (35 MIC.)	C.F/P WHITE (30 MIC.)			100	30
		WALL	BARE STEEL	DITTO	DITTO	DITTO				141
		FLOOR	DECK COMPOS.	NO PAINT						
	GARB. ROOM	CEILING	BARE STEEL	C.A/C LIGHT GRAY (35 MIC.)	C.WHITE A/C (35 MIC.)	C.F/P WHITE (30 MIC.)			100	13
		WALL	BARE STEEL	DITTO	DITTO	DITTO				42
		FLOOR	BARE STEEL	DITTO	C.D/P STORM GRAY (35 MIC.)				70	7
	DRY PROVISION STORE	CEILING	ALUMINUM SHEET	NO PAINT						
		WALL	ALUMINUM SHEET	DITTO						
		FLOOR	DECK COMPOS.	DITTO						
	HANDLING SPACE	CEILING	BARE STEEL	C.A/C LIGHT GRAY (35 MIC.)	C.WHITE A/C (35 MIC.)	C.F/P WHITE (30 MIC.)			100	80
		WALL	BARE STEEL	DITTO	DITTO	DITTO				163
		FLOOR	BARE STEEL	DITTO	C.D/P STORM GRAY (35 MIC.)				70	10
		FLOOR	DECK COMPOS.	NO PAINT						

13. ACCOMMODATION SPACE (13/16)

	APPLICATION PART	PAINTING SYSTEM		1ST COAT	2ND COAT	3RD COAT	4TH COAT	FINAL COAT	T.D.F.T. (MICRONS)	
IN UPPER DECK	BONDED STORE	CEILING	BARE STEEL	C.A/C LIGHT GRAY (35 MIC.)	C.WHITE A/C (35 MIC.)	C.F/P WHITE (30 MIC.)			100	4
		CEILING	COLORED GALVD. SHEET	(PREPAINTED BY SUBCONTRACTOR, FINISHING COLOR: WHITE)						
		WALL	COLORED GALVD. SHEET	DITTO						
		WALL	BARE STEEL	C.A/C LIGHT GRAY (35 MIC.)	C.WHITE A/C (35 MIC.)	C.F/P WHITE (30 MIC.)			100	48
		FLOOR	BARE STEEL	DITTO	C.D/P STORM GRAY (35 MIC.)				70	5
	SWIMMING POOL SPACE	CEILING	BARE STEEL	DITTO	C.WHITE A/C (35 MIC.)	C.F/P WHITE (30 MIC.)			100	82
		WALL	BARE STEEL	DITTO	DITTO	DITTO				96
		FLOOR	BARE STEEL	DITTO	C.D/P STORM GRAY (35 MIC.)				70	25
		POOL INSIDE	SIDE & BOTTOM	P/E A/C FWT CREAM (70 MIC.)	P/E F/P FWT WHITE (70 MIC.)	P/E F/P FWT BLUE (70 MIC.)			210	61
	DUCT TRUNK(3), PIPE & ELECT. CABLE TRUNK	INSIDE	BARE STEEL	C.A/C LIGHT GRAY (35 MIC.)	C.A/C LIGHT GRAY (35 MIC.)				70	75
	GARBAGE CHUTE	INSIDE	BARE STEEL	P/E A/C FWT CREAM (70 MIC.)	P/E F/P FWT WHITE (70 MIC.)	P/E F/P FWT BLUE (70 MIC.)			210	8
	ELEV. TRUNK	INSIDE		SEE PAGE 36						
	DUMB-WAITER (SECOND TIER ~ UPPER DECK)	INSIDE	BARE STEEL	C.A/C LIGHT GRAY (35 MIC.)	C.A/C LIGHT GRAY (35 MIC.)				70	24

13. ACCOMMODATION SPACE (14/16)

	APPLICATION PART	PAINTING SYSTEM		1ST COAT	2ND COAT	3RD COAT	4TH COAT	FINAL COAT	T.D.F.T. (MICRONS)	
ON SECOND DECK	STEEL SURFACE BEHIND LINING, CEILING & INSULATION	CEILING		C.A/C LIGHT GRAY (35 MIC.)					35	} 269
		WALL		DITTO						
	SHIP'S LAUNDRY	CEILING	STAINL. STEEL SHEET	NO PAINT						
		WALL	STAINL. STEEL SHEET	DITTO						
		FLOOR	MOSAIC TILE	DITTO						
	CLEAN LINEN LOCKER, DIRTY LINEN LOCKER	CEILING	COLORED GALVD. SHEET	(PREPAINTED BY SUBCONTRACTOR, FINISHING COLOR: WHITE)						
		CEILING	BARE STEEL	C.A/C LIGHT GRAY (35 MIC.)	C.WHITE A/C (35 MIC.)	C.F/P WHITE (30 MIC.)			100	} 144
		WALL	BARE STEEL	DITTO	DITTO	DITTO				
		WALL	COLORED GALVD. SHEET	(PREPAINTED BY SUBCONTRACTOR, FINISHING COLOR: WHITE)						
		FLOOR	BARE STEEL	C.A/C LIGHT GRAY (35 MIC.)	C.D/P STORM GRAY (35 MIC.)				70	19
	STAIRWAY COMPANION FOR ACCOMMODATION SPACE	CEILING	MODULAR PANEL	PVC LAMINATED						
		WALL	MODULAR PANEL	DITTO						
		FLOOR	VINYL TILE	NO PAINT						
	LOCKER, PASSAGE WAY (FR.268-279)	CEILING	BARE STEEL	C.A/C LIGHT GRAY (35 MIC.)	C.WHITE A/C	C.F/P WHITE (30 MIC.)			100	} 305
		WALL	BARE STEEL	DITTO	DITTO	DITTO				
		FLOOR	BARE STEEL	DITTO	C.D/P STORM GRAY (35 MIC.)				70	96

13. ACCOMMODATION SPACE (15/16)

	APPLICATION PART	PAINTING SYSTEM		1ST COAT	2ND COAT	3RD COAT	4TH COAT	FINAL COAT	T.D.F.T. (MICRONS)	
ON SECOND DECK	FIRE STATION, FORWARD SWITCH BOARD ROOM,	CEILING	BARE STEEL	C.A/C LIGHT GRAY (35 MIC.)	C.WHITE A/C (35 MIC.)	C.F/P WHITE (30 MIC.)			100	} 121
		WALL	BARE STEEL	DITTO	DITTO	DITTO				
		WALL	COLORED GALVD. SHEET	(PREPAINTED BY SUBCONTRACTOR, FINISHING COLOR: WHITE)						
		FLOOR	BARE STEEL	C.A/C LIGHT GRAY (35 MIC.)	C.D/P STORM GRAY (35 MIC.)				70	13
	ELEV. MACHINE ROOM	CEILING	COLORED GALVD. SHEET	(PREPAINTED BY SUBCONTRACTOR, FINISHING COLOR: WHITE)						
		WALL	BARE STEEL	C.A/C LIGHT GRAY (35 MIC.)	C.WHITE A/C (35 MIC.)	C.F/P WHITE (30 MIC.)			100	55
		FLOOR	BARE STEEL	DITTO	C.D/P STORM GRAY (35 MIC.)				70	8
	PROV. REF. MACHINE ROOM	CEILING	BARE STEEL	DITTO	C.WHITE A/C (35 MIC.)	C.F/P WHITE (30 MIC.)			100	25
		CEILING	COLORED GALVD. SHEET	(PREPAINTED BY SUBCONTRACTOR, FINISHING COLOR: WHITE)						
		WALL	BARE STEEL	C.A/C LIGHT GRAY (35 MIC.)	C.WHITE A/C (35 MIC.)	C.F/P WHITE (30 MIC.)			100	146
		FLOOR	BARE STEEL	DITTO	C.D/P STORM GRAY (35 MIC.)					5
	DUCT TRUNK, PIPE & ELECT. CABLE TRUNK	INSIDE	BARE STEEL	DITTO	C.A/C LIGHT GRAY (35 MIC.)				70	122
	ELEV. TRUNK (SIXTH TIER ~ SECOND DECK)	INSIDE	BARE STEEL	DITTO	DITTO					240
	CO2 BOTTLE RM			SEE PAGE 40						

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13. ACCOMMODATION SPACE (16/16)

	APPLICATION PART	PAINTING SYSTEM	1ST COAT	2ND COAT	3RD COAT	4TH COAT	FINAL COAT	T.D.F.T. (MICRONS)	
EQUIPMENT	ACCOMMODATION EQUIPMENT	FURNITURE, ACCOMMODATION DOOR, ETC	SEE OTHER DRAWING (DWG.NO.4111020 SAMPLE OF UPHOLSTERY)						
EQUIPMENT	STAIRWAY		SEE OTHER DRAWING (DWG.NO.4111801 INTERIOR STAIRWAY)						
EQUIPMENT	STORE AND LOCKER EQUIPMENT	LOCKER, WORKING TABLE, SHELVES ETC. / IN CASE OF READY MADE	MAKER'S STANDARD						
EQUIPMENT	STORE AND LOCKER EQUIPMENT	LOCKER, WORKING TABLE, SHELVES ETC. / IN CASE OF ORDER MADE / STEEL	C.A/C LIGHT GRAY (35 MIC.)	C.A/C LIGHT GRAY (35 MIC.)	C.F/P 7.5BG7/2 (30 MIC.)	C.F/P 7.5BG7/2 (30 MIC.)		130	306
EQUIPMENT	STORE AND LOCKER EQUIPMENT	LOCKER, WORKING TABLE, SHELVES ETC. / IN CASE OF ORDER MADE / WOOD	NO PAINT						
EQUIPMENT	STORE AND LOCKER EQUIPMENT	BATTERY RACK / STEEL	P/E A/C GRAY (70 MIC.)	P/E F/P WHITE (70 MIC.)	P/E F/P WHITE (70 MIC.)			210	6
EQUIPMENT	STEEL DOOR		SEE PAGE 61						
EQUIPMENT	VENTILATION TRUNK		SEE PAGE 67						
EQUIPMENT	PIPING & VALVES		SEE PAGE 71 & 72						
EQUIPMENT	ELECTRIC EQUIPMENT		SEE PAGE 83						

MITSUI ENGINEERING & SHIPBUILDING CO.,LTD.

14. MACHINERY AND STORE SPACE (1/6)

	APPLICATION PART	PAINTING SYSTEM		1ST COAT	2ND COAT	3RD COAT	4TH COAT	FINAL COAT	T.D.F.T. (MICRONS)	
ON UPPER DECK (FR.50 - 58)	EMERG.GEN. ROOM	CEILING	BARE STEEL	C.A/C LIGHT GRAY (35 MIC.)	C.WHITE A/C (35 MIC.)	C.F/P WHITE (30 MIC.)			100	78
		WALL	STEEL SURFACE BEHIND INSULAT.	DITTO					35	56
		WALL	COLORED GALVD. SHEET	(PREPAINTED BY SUBCONTRACTOR. FINISHING COLOR:WHITE)						
		WALL	BARE STEEL	C.A/C LIGHT GRAY (35 MIC.)	C.WHITE A/C (35 MIC.)	C.F/P WHITE (30 MIC.)			100	164
		FLOOR	UNDER GEN.& AREA ENCLOSED BY GUTTER BAR	T/E NB LIGHT GRAY (100 MIC.)	T/E NB LIGHT GRAY (100 MIC.)				200	4
		FLOOR	OTHER	C.A/C LIGHT GRAY (35 MIC.)	C.D/P NON-SKID STORM GRAY (35 MIC.)				70	46
	ENGINE CONFERENCE ROOM, LAVATORY	STEEL SURFACE BEHIND LINING, CEILING & INSULAT.	CEILING	DITTO					35	60
		STEEL SURFACE BEHIND LINING, CEILING & INSULAT. / WALL / SURFACE EXPOSED TO WEATHER	BEHIND MODULAR LINING PANEL	T/E HB BLACK (200 MIC.)					200	30
		STEEL SURFACE BEHIND LINING, CEILING & INSULAT. / WALL / SURFACE EXPOSED TO WEATHER	OTHER	C.A/C LIGHT GRAY (35 MIC.)					35	} 93
		STEEL SURFACE BEHIND LINING, CEILING & INSULAT. / WALL	SURFACE NOT EXPOSED TO WEATHER	DITTO						
		CEILING & WALL	MODULAR PANEL	PVC LAMINATED						
		FLOOR	UNDER DECK COVERING	NO PAINT						
		FLOOR	ABOVE DECK COVERING	DITTO						
	AIR VENT BOX SPACE (FR.50-51) (WEATHER CONDITION)	CEILING	BARE STEEL	CHR A/C DARK GRAY (40 MIC.)	CHR A/C LIGHT GRAY (40 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)		140	} 12
		WALL	BARE STEEL	DITTO	DITTO	DITTO	DITTO			
		FLOOR	BARE STEEL	T/E HB BLACK (200 MIC.)					200	2

MITSUI ENGINEERING & SHIPBUILDING CO.,LTD.

14. MACHINERY AND STORE SPACE (2/6)

	APPLICATION PART	PAINTING SYSTEM		1ST COAT	2ND COAT	3RD COAT	4TH COAT	FINAL COAT	T.D.F.T. (MICRONS)	
ON UPPER DECK (FR.50 - 58)	ENTRANCE SPACE FOR ENG.RM. (FR.55-56) FIRE EQ.RM. (FR.50-52) CO2 BOTTLE RECESS FOR PAINT RM. LOBBY FOR ELEV.	CEILING	BARE STEEL	C.A/C LIGHT GRAY (35 MIC.)	C.WHITE A/C (35 MIC.)	C.F/P WHITE (30 MIC.)			100	3
		WALL	BARE STEEL	DITTO	DITTO	DITTO				31
		FLOOR	BARE STEEL	DITTO	C.D/P STORM GRAY (35 MIC.)				70	3
	PAINT ROOM, FIRE EQ.RM (FR.50-52)	CEILING & WALL	STEEL SURFACE BEHIND INSULAT.	DITTO					35	15
		CEILING & WALL	COLORED GALVD. SHEET	(PREPAINTED BY SUBCONTRACTOR. FINISHING COLOR:WHITE)						
		CEILING & WALL	BARE STEEL	C.A/C LIGHT GRAY (35 MIC.)	C.WHITE A/C (35 MIC.)	C.F/P WHITE (30 MIC.)			100	87
		FLOOR	BARE STEEL	DITTO	C.D/P STORM GRAY (35 MIC.)				70	17
	VENT.TRUNK	INSIDE (BARE STEEL)	DOWN TO 4 METER INWARD FROM EXPOSED OUTLET/INLET	T/E RED BROWN (100 MIC.)	T/E BLACK (100 MIC.)				200	178
		INSIDE (BARE STEEL)	OTHER PART	C.A/C LIGHT GRAY (35 MIC.)	C.A/C LIGHT GRAY (35 MIC.)				70	44
	ELEV.TRUNK	INSIDE		SEE PAGE 48						
	ENGINE CASING			SEE PAGE 44						
ON UPPER DECK (FR.287-FORE)	BOATSN'S STORE	CEILING	BARE STEEL	C.A/C LIGHT GRAY (35 MIC.)	C.WHITE A/C (35 MIC.)	C.F/P WHITE (30 MIC.)			100	842
		WALL	BARE STEEL	DITTO	DITTO	DITTO				898
		FLOOR	BARE STEEL	DITTO	C.D/P STORM GRAY (35 MIC.)				70	180

MITSUI ENGINEERING & SHIPBUILDING CO.,LTD.

14. MACHINERY AND STORE SPACE (3/6)

	APPLICATION PART	PAINTING SYSTEM		1ST COAT	2ND COAT	3RD COAT	4TH COAT	FINAL COAT	T.D.F.T. (MICRONS)	
ON UPPER DECK	LADDER COMPANION FOR STEERING GEAR RM	CEILING	BARE STEEL	C.A/C LIGHT GRAY (35 MIC.)	C.WHITE A/C (35 MIC.)	C.F/P WHITE (30 MIC.)			100	} 25
		WALL	BARE STEEL	DITTO	DITTO	DITTO				
		FLOOR	BARE STEEL	DITTO	C.D/P STORM GRAY (35 MIC.)				70	2
ON UPPER DECK / IN FAN HOUSE	COMPANION SPACE FOR CARGO HOLD (2)	CEILING	BARE STEEL	T/E NB LIGHT GRAY (125 MIC.)					125	} 50
		WALL	BARE STEEL	DITTO						
		FLOOR	BARE STEEL	DITTO						4
	FAN ROOM (INCLUD. EXH'T TRUNK)	CEILING	BARE STEEL	T/E RED BROWN (100 MIC.)	T/E BLACK (100 MIC.)				200	} 992
		WALL	BARE STEEL	DITTO	DITTO					
		FLOOR	BARE STEEL	DITTO	DITTO					
ON 2ND DECK (FR.279-296)	CO2 BOTTLE ROOM	CEILING & WALL	COLORED GALVD. SHEET	(PREPAINTED BY SUBCONTRACTOR. FINISHING COLOR:WHITE)						
		CEILING & WALL	BARE STEEL	C.A/C LIGHT GRAY (35 MIC.)	C.WHITE A/C (35 MIC.)	C.F/P WHITE (30 MIC.)			100	1,101
		FLOOR	BARE STEEL	C.A/C LIGHT GRAY (35 MIC.)	C.D/P STORM GRAY (35 MIC.)				70	126
	LADDER COMPANION (FR.279-283)	CEILING	COLORED GALVD. SHEET	(PREPAINTED BY SUBCONTRACTOR. FINISHING COLOR:WHITE)						
		CEILING	BARE STEEL	C.A/C LIGHT GRAY (35 MIC.)	C.WHITE A/C (35 MIC.)	C.F/P WHITE (30 MIC.)			100	} 93
		WALL	BARE STEEL	DITTO	DITTO	DITTO				
		FLOOR	BARE STEEL	DITTO	C.D/P STORM GRAY (35 MIC.)				70	4

MITSUI ENGINEERING & SHIPBUILDING CO.,LTD.

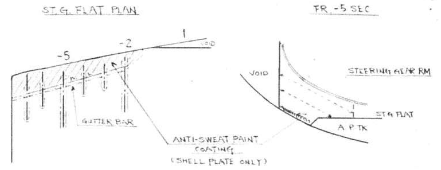
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14. MACHINERY AND STORE SPACE (4/6)

APPLICATION PART		PAINTING SYSTEM		1ST COAT	2ND COAT	3RD COAT	4TH COAT	FINAL COAT	T.D.F.T. (MICRONS)	
ON 3RD DECK (FR.266-279)	AIR COND. UNIT ROOM	CEILING	COLORED GALVD. SHEET	(PREPAINTED BY SUBCONTRACTOR. FINISHING COLOR:WHITE)						
			BARE STEEL	C.A/C LIGHT GRAY (35 MIC.)	C.WHITE A/C (35 MIC.)	C.F/P WHITE (30 MIC.)			100	} 1257
		WALL	BARE STEEL	DITTO	DITTO	DITTO				
		FLOOR	UNDER MACH. UNIT & AREA ENCLOSED BY GUTTER BAR	T/E NB LIGHT GRAY (100 MIC.)	T/E NB LIGHT GRAY (100 MIC.)				200	30
			OTHER	T/E NB NON-SKID LIGHT GRAY (100 MIC.)					100	76
ON STEERING FLAT	STEERING GEAR ROOM INCLUDING ACCESS SPACE FOR PASSAGE WAY	CEILING	BARE STEEL	C.A/C LIGHT GRAY (35 MIC.)	C.WHITE A/C (35 MIC.)	C.F/P WHITE (30 MIC.)			100	945
		WALL	ANTI-SWEAT COATING AREA	DITTO	DITTO	DITTO	ANTI-SWEAT PAINT SEALER (1MM IN TOTAL)	ANTI-SWEAT PAINT WHITE	1100	6
			OTHER PART (BARE STEEL)	DITTO	DITTO	DITTO			100	1,419
		FLOOR	UNDER MACH. UNIT & AREA ENCLOSED BY GUTTER BAR	DITTO	C.O/R F/P STORM GRAY (25 MIC.)				60	10
			OTHER	DITTO	C.O/R F/P NON-SKID STORM GRAY (25 MIC.)					460

EXTENT OF ANTI-SWEAT PAINT COATING

ST.G. FLAT PLAN — FR. -5 SEC



14. MACHINERY AND STORE SPACE (5/6)

APPLICATION PART		PAINTING SYSTEM		1ST COAT	2ND COAT	3RD COAT	4TH COAT	FINAL COAT	T.D.F.T. (MICRONS)	
BELOW 3RD DECK (FR.266-287)	FWD MACHINERY SPACE	CEILING	COLORED GALVD. SHEET	(PREPAINTED BY SUBCONTRACTOR. FINISHING COLOR:WHITE)						
			BARE STEEL	C.A/C LIGHT GRAY (35 MIC.)	C.WHITE A/C (35 MIC.)	C.F/P WHITE (30 MIC.)			100	665
		WALL	ABOVE FLOOR PLATE LEVEL	DITTO	DITTO	DITTO				864
			BELOW FLOOR PLATE LEVEL	DITTO	DITTO	C.O/R F/P STORM GRAY (25 MIC.)			95	132
		FLOOR	UNDER MACHINERY UNIT	DITTO	C.O/R F/P STORM GRAY (25 MIC.)					} 129
			OTHER	DITTO	DITTO				60	
		FLOOR PLATE	UPPER SURFACE (STEEL)	DITTO	DITTO					62
			UNDER SURFACE (STEEL)	DITTO	C.A/C LIGHT GRAY (35 MIC.)				70	62
			SUPPORT (STEEL)	DITTO	C.O/R F/P STORM GRAY (25 MIC.)				60	94
BELOW UPPER DECK	UNDER DECK PASSAGE (FR.84-268, FR.12-50)	CEILING	BARE STEEL	C.A/C LIGHT GRAY (35 MIC.)	C.WHITE A/C (35 MIC.)	C.F/P WHITE (30 MIC.)			100	} 9622
		WALL	BARE STEEL	DITTO	DITTO	DITTO				
		FLOOR	BARE STEEL	DITTO	C.D/P STORM GRAY (35 MIC.)				70	942
EQUIPMENT	ACCESS PLATFORM IN AIR COND.RM	FLOOR PLATE	UPPER SURFACE (STEEL)	C.A/C LIGHT GRAY (35 MIC.)	C.D/P STORM GRAY (35 MIC.)					6
			UNDER SURFACE (STEEL)	DITTO	C.A/C LIGHT GRAY (35 MIC.)				70	6
		SUPPORT	STEEL	DITTO	C.D/P STORM GRAY (35 MIC.)					10

14. MACHINERY AND STORE SPACE (6/6)

APPLICATION PART		PAINTING SYSTEM		1ST COAT	2ND COAT	3RD COAT	4TH COAT	FINAL COAT	T.D.F.T. (MICRONS)	
EQUIPMENT	INCLINED LADDER FOR STEERING GEAR RM & FWD MACH. SPACE	SIDE STRINGER	STEEL	C.A/C LIGHT GRAY (35 MIC.)	C.A/C LIGHT GRAY (35 MIC.)	C.F/P WHITE (30 MIC.)	C.F/P WHITE (30 MIC.)		130	30
		TREAD	UPPER SURFACE (STEEL)	DITTO	DITTO	C.D/P STORM GRAY (35 MIC.)			105	8
			UNDER SURFACE (STEEL)	DITTO	DITTO	C.F/P WHITE (30 MIC.)	C.F/P WHITE (30 MIC.)			8
		HAND RAIL	STEEL	DITTO	DITTO	C.F/P STORM GRAY (30 MIC.)	C.F/P STORM GRAY (30 MIC.)		130	14
	VERTICAL LADDER	STEEL		DITTO	DITTO	C.F/P WHITE (30 MIC.)	C.F/P WHITE (30 MIC.)			12
	LADDER FOR CARGO HOLD			SEE PAGE 51						
	STORE AND LOCKER EQUIPMENT	LOCKER, WORKING TABLE, SHELVES, ETC.	IN CASE OF READY MADE	(MAKER'S STANDARD)						
			IN CASE OF ORDER MADE — STEEL	C.A/C LIGHT GRAY (35 MIC.)	C.A/C LIGHT GRAY (35 MIC.)	C.F/P 7.5BG7/2 (30 MIC.)	C.F/P 7.5BG7/2 (30 MIC.)		130	52
			IN CASE OF ORDER MADE — GALVD.	B/C (35 MIC.)	C.F/P 7.5BG7/2 (30 MIC.)	C.F/P 7.5BG7/2 (30 MIC.)			95	10
	STEEL DOOR			SEE PAGE 61						
	VENTILATION TRUNK			SEE PAGE 68						
	PIPING AND VALVES			SEE PAGE 72 & 73						
	MACHINERY			SEE PAGE 81						

15..ENGINE ROOM AND BOILER SPACE (1/6)

APPLICATION PART		PAINTING SYSTEM		1ST COAT	2ND COAT	3RD COAT	4TH COAT	FINAL COAT	T.D.F.T. (MICRONS)	
HULL PART	ENGINE CASING PART (ABOVE UPPER DECK)	CEILING	BARE STEEL	C.A/C LIGHT GRAY (35 MIC.)	C.WHITE A/C (35 MIC.)	C.F/P WHITE (30 MIC.)			100	} 1604
		WALL	BARE STEEL	DITTO	DITTO	DITTO				
		FLOOR (UPP.DK)	BARE STEEL	DITTO	C.D/P STORM GRAY (35 MIC.)				70	85
	ENGINE ROOM & BOILER SPACE	CEILING (INCLUDING UNDER SIDE OF PARTIAL DECK)	STEEL SURFACE BEHIND INSULAT.	DITTO					35	88
			COLORED GALVD. SHEET	(PREPAINTED BY SUBCONTRACTOR. FINISHING COLOR:WHITE)						
			BARE STEEL	C.A/C LIGHT GRAY (35 MIC.)	C.WHITE A/C (35 MIC.)	C.F/P WHITE (30 MIC.)			100	4,142
		WALL (INCLUDING PILLAR) — ABOVE FLOOR PLATE	STEEL SURFACE BEHIND INSULAT.	C.A/C LIGHT GRAY (35 MIC.)					35	167
			COLORED GALVD. SHEET	(PREPAINTED BY SUBCONTRACTOR. FINISHING COLOR:WHITE)						
			BARE STEEL	C.A/C LIGHT GRAY (35 MIC.)	C.WHITE A/C (35 MIC.)	C.F/P WHITE (30 MIC.)			100	3,133
		WALL (INCLUDING PILLAR) — BELOW FLOOR PLATE	UP TO BLOCK JOINT FROM TK.TOP	T/E N/B LIGHT GRAY (100 MIC.)	T/E N/B LIGHT GRAY (100 MIC.)				200	104
			OTHER	C.A/C LIGHT GRAY (35 MIC.)	C.WHITE A/C (35 MIC.)	C.F/P LIGHT GRAY (30 MIC.)			100	798
		TANK TOP	INCLUD. ENGINE PIT	T/E N/B LIGHT GRAY (100 MIC.)	T/E N/B LIGHT GRAY (100 MIC.)				200	478
		UPPER SURFACE OF ALL PARTIAL DECK	UNDER D/GEN. & T/GEN. AND AREA ENCLOSED BY GUTTER BAR OF ITS GEN.	DITTO	DITTO					36
			OTHER DECK	C.A/C LIGHT GRAY (35 MIC.)	C.D/P RED L274 (35 MIC.)				70	858
		FLOOR PLATE & ITS SUPPORT		SEE PAGE 48						

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15. ENGINE ROOM AND BOILER SPACE (2/6)

	APPLICATION PART	PAINTING SYSTEM		1ST COAT	2ND COAT	3RD COAT	4TH COAT	FINAL COAT	T.D.F.T. (MICRONS)	
HULL PART	ELECTRIC WORK SHOP, (ON PARTIAL DECK PLAN)	CEILING & WALL	STEEL SURFACE BEHIND INSULAT.	C.A/C LIGHT GRAY (35 MIC.)					35	30
			COLORED GALVD. SHEET	(PREPAINTED BY SUBCONTRACTOR, FINISHING COLOR: WHITE)						
	WORK SHOP, (ON 2ND DECK)		BARE STEEL	C.A/C LIGHT GRAY (35 MIC.)	C.WHITE A/C (35 MIC.)	C.F/P WHITE (30 MIC.)			100	285
		FLOOR	BARE STEEL	C.A/C LIGHT GRAY (35 MIC.)	C.D/P RED L274 (35 MIC.)				70	87
	CHANGING ROOM (ON PARTIAL DECK PLAN)	CEILING	BARE STEEL	DITTO	C.WHITE A/C (35 MIC.)	C.F/P WHITE (30 MIC.)			100	21
		WALL	STEEL SURFACE BEHIND INSULAT.	DITTO					35	15
			COLORED GALVD. SHEET	(PREPAINTED BY SUBCONTRACTOR, FINISHING COLOR: WHITE)						
			BARE STEEL	C.A/C LIGHT GRAY (35 MIC.)	C.WHITE A/C (35 MIC.)	C.F/P WHITE (30 MIC.)			100	45
		FLOOR	BARE STEEL	DITTO	C.D/P RED L274 (35 MIC.)				70	13
	ENGINE STORE, (ON PARTIAL DECK PLAN)	CEILING	BARE STEEL	DITTO	C.WHITE A/C (35 MIC.)	C.F/P WHITE (30 MIC.)				
		WALL	BARE STEEL	DITTO	DITTO	DITTO			100	}438
			EXPAND METAL WALL	DITTO	DITTO	DITTO				
		FLOOR	BARE STEEL	DITTO	C.D/P RED L274 (35 MIC.)				70	76
	ELEV. MACHINE SPACE, (ON PARTIAL DECK PLAN)	CEILING	BARE STEEL	DITTO	C.WHITE A/C (35 MIC.)	C.F/P WHITE (30 MIC.)			100	}107
		WALL	BARE STEEL	DITTO	DITTO	DITTO				
	TOILET, (ON 2ND DECK)	FLOOR	BARE STEEL	DITTO	C.D/P RED L274 (35 MIC.)				70	11

15. ENGINE ROOM AND BOILER SPACE (3/6)

	APPLICATION PART	PAINTING SYSTEM		1ST COAT	2ND COAT	3RD COAT	4TH COAT	FINAL COAT	T.D.F.T. (MICRONS)	
HULL PART	ELECTRIC STORE (ON PARTIAL DECK PLAN)	CEILING & WALL	STEEL SURFACE BEHIND INSULAT	C.A/C LIGHT GRAY (35 MIC.)					35	9
			COLORED GALVD. SHEET	(PREPAINTED BY SUBCONTRACTOR, FINISHING COLOR: WHITE)						
			BARE STEEL	C.A/C LIGHT GRAY (35 MIC.)	C.WHITE A/C (35 MIC.)	C.F/P WHITE (30 MIC.)			100	}60
			EXPAND METAL WALL	DITTO	DITTO	DITTO				
		FLOOR	BARE STEEL	DITTO	C.D/P RED L274 (35 MIC.)				70	20
	ACCESS SPACE FOR PASSAGE WAY (FR.50-54,S FR.50-62,P FR.78-84,P/S) (ON PARTIAL DECK PLAN)	CEILING	BARE STEEL	DITTO	C.WHITE A/C (35 MIC.)	C.F/P WHITE (30 MIC.)			100	}526
		WALL	BARE STEEL	DITTO	DITTO	DITTO				
		FLOOR	BARE STEEL	DITTO	C.D/P RED L274 (35 MIC.)				70	36
	COMPARTMENT FOR PUMPS & LOOSE TANK (FR.58-62,P FR.66-70,P) (ON 2ND DECK)	CEILING	BARE STEEL	DITTO	C.WHITE A/C (35 MIC.)	C.F/P WHITE (30 MIC.)			100	}116
		WALL	BARE STEEL	DITTO	DITTO	DITTO				
		FLOOR	BARE STEEL	DITTO	C.D/P RED L274 (35 MIC.)				70	9
	ACCESS SPACE FOR SIDE PORT (FR.50-58,S) (ON 2ND DECK)	CEILING	BARE STEEL	DITTO	C.WHITE A/C (35 MIC.)	C.F/P WHITE (30 MIC.)			100	}200
		WALL	BARE STEEL	DITTO	DITTO	DITTO				
		FLOOR	BARE STEEL	DITTO	C.D/P RED L274 (35 MIC.)				70	18

15. ENGINE ROOM AND BOILER SPACE (4/6)

	APPLICATION PART	PAINTING SYSTEM		1ST COAT	2ND COAT	3RD COAT	4TH COAT	FINAL COAT	T.D.F.T. (MICRONS)	
HULL PART	ENGINE CONTROL ROOM (ON 2ND DECK)	CEILING & WALL	STEEL SURFACE BEHIND INSULAT. & LINING	C.A/C LIGHT GRAY (35 MIC.)					35	472
			LINING SURFACE	NO PAINT						
		FLOOR	STEEL DECK BEHIND DECK COVERING	DITTO						
			ABOVE DECK COVERING	DITTO						
	PURIFIER SPACE (ON 3RD DECK)	CEILING & WALL	STEEL SURFACE BEHIND INSULAT.	C.A/C LIGHT GRAY (35 MIC.)					35	38
			COLORED GALVD. SHEET	(PREPAINTED BY SUBCONTRACTOR, FINISHING COLOR: WHITE)						
			BARE STEEL: ABOVE FLOOR PLATE LEVEL	C.A/C LIGHT GRAY (35 MIC.)	C.WHITE A/C (35 MIC.)	C.F/P WHITE (30 MIC.)			100	296
			BARE STEEL: BELOW FLOOR PLATE LEVEL	DITTO	DITTO	C.O/R F/P RED L274 (25 MIC.)			95	6
		FLOOR	BARE STEEL	DITTO	C.O/R F/P RED L274 (25 MIC.)				60	57
		FLOOR PLATE & ITS SUPPORT		SEE PAGE 48						
	SHAFT TUNNEL (FR.21 - 50)	CEILING	BARE STEEL	C.A/C LIGHT GRAY (35 MIC.)	C.WHITE A/C (35 MIC.)	C.F/P WHITE (30 MIC.)			100	771
		WALL	ABOVE FLOOR PLATE LEVEL	DITTO	DITTO	DITTO				1507
			BELOW FLOOR PLATE LEVEL: UP TO BLOCK JOINT FROM TK.TOP	T/E N/B LIGHT GRAY (100 MIC.)	T/E N/B LIGHT GRAY (100 MIC.)				200	38
			BELOW FLOOR PLATE LEVEL: OTHER	C.A/C LIGHT GRAY (35 MIC.)	C.WHITE A/C (35 MIC.)	C.F/P LIGHT GRAY (30 MIC.)			100	322
		FLOOR	BARE STEEL	T/E N/B LIGHT GRAY (100 MIC.)	T/E N/B LIGHT GRAY (100 MIC.)				200	112
		FLOOR PLATE & ITS SUPPORT		SEE PAGE 48						

15. ENGINE ROOM AND BOILER SPACE (5/6)

	APPLICATION PART	PAINTING SYSTEM		1ST COAT	2ND COAT	3RD COAT	4TH COAT	FINAL COAT	T.D.F.T. (MICRONS)	
HULL PART	ELEV. TRUNK	INSIDE	BARE STEEL	C.A/C LIGHT GRAY (35 MIC.)	C.A/C LIGHT GRAY (35 MIC.)					130
	ESCAPE TRUNK	FOR SHAFT TUNNEL	FR.29 - 31,S	DITTO	DITTO				70	}196
		FOR ENGINE CONT.RM	FR.562/3 - 58,S	DITTO	DITTO					
EQUIPMENT	LOWEST FLOOR PLATE (IN ENGINE RM, SHAFT TUNNEL, AND PURIFIER ROOM)	FLOOR PLATE	UPPER SURFACE (STEEL)	C.A/C LIGHT GRAY (35 MIC.)	C.O/R F/P RED L274 (25 MIC.)				60	320
			UNDER SURFACE (STEEL)	C.A/C LIGHT GRAY (35 MIC.)	C.A/C LIGHT GRAY (35 MIC.)				70	320
		SUPPORT	BARE STEEL	DITTO	DITTO					480
	ACCESS PLATFORM & STAGE (EXCEPT ABOVE)	FLOOR PLATE	UPPER SURFACE (STEEL)	DITTO	C.O/R F/P RED L274 (25 MIC.)				60	264
			UNDER SURFACE: VISIBLE PART	DITTO	C.A/C LIGHT GRAY (35 MIC.)	C.F/P WHITE (30 MIC.)	C.F/P WHITE (30 MIC.)		130	132
			UNDER SURFACE: IN-VISIBLE PART	DITTO	DITTO				70	132
		OPEN GRATING	STEEL	PREPAINTED BY THE SUBCONTRACTOR (AMINO POLYESTER RESIN COATING)						
		SUPPORT (STEEL)	VISIBLE PART	C.A/C LIGHT GRAY (35 MIC.)	C.A/C LIGHT GRAY (35 MIC.)	C.F/P WHITE (30 MIC.)	C.F/P WHITE (30 MIC.)		130	198
			IN-VISIBLE PART	DITTO	DITTO				70	198

15. ENGINE ROOM AND BOILER SPACE (6/6)

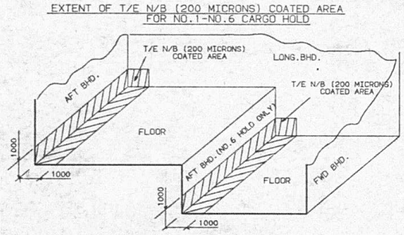
APPLICATION PART		PAINTING SYSTEM		1ST COAT	2ND COAT	3RD COAT	4TH COAT	FINAL COAT	T.D.F.T. (MICRONS)	
EQUIPMENT	INCLINED LADDER	SIDE STRINGER	STEEL	C.A/C LIGHT GRAY (35 MIC.)	C.A/C LIGHT GRAY (35 MIC.)	C.F/P WHITE (30 MIC.)	C.F/P WHITE (30 MIC.)		130	94
		TREAD	OPEN GRATING	PREPAINTED BY THE SUBCONTRACTOR (AMINO POLYESTER RESIN COATING)						
		DUST COVER	OUTSIDE (STEEL)	C.A/C LIGHT GRAY (35 MIC.)	C.A/C LIGHT GRAY (35 MIC.)	C.F/P WHITE (30 MIC.)	C.F/P WHITE (30 MIC.)			64
			INSIDE (STEEL)	DITTO	DITTO	C.F/P STORM GRAY (30 MIC.)	C.F/P STORM GRAY (30 MIC.)			64
	VERTICAL LADDER	STEEL		DITTO	DITTO	C.F/P WHITE (30 MIC.)	C.F/P WHITE (30 MIC.)		130	16
	HANDRAIL	STEEL		DITTO	DITTO	C.F/P STORM GRAY (30 MIC.)	C.F/P STORM GRAY (30 MIC.)			208
	LIFTING BEAM	STEEL		DITTO	DITTO	C.F/P WHITE (30 MIC.)	C.F/P WHITE (30 MIC.)			134
	LOCKER, WORKING TABLE, SHELVES, ETC.	IN CASE OF READY MADE		MAKER'S STANDARD						
		IN CASE OF ORDER MADE	STEEL	C.A/C LIGHT GRAY (35 MIC.)	C.A/C LIGHT GRAY (35 MIC.)	C.F/P 7.5BG7/2 (30 MIC.)	C.F/P 7.5BG7/2 (30 MIC.)		130	160
			GALVD.	B/C (35 MIC.)	C.F/P 7.5BG7/2 (30 MIC.)	C.F/P 7.5BG7/2 (30 MIC.)			95	40
	STEEL DOOR			SEE PAGE 61						
	VENTILATION TRUNK			SEE PAGE 68						
	PIPING AND VALVES			SEE PAGE 74~76						
	MACHINERY			SEE PAGE 81 & 82						

MITSUI ENGINEERING & SHIPBUILDING CO.,LTD.

16. CARGO HOLD AND TANKS (1/6)

APPLICATION PART		PAINTING SYSTEM		1ST COAT	2ND COAT	3RD COAT	4TH COAT	FINAL COAT	T.D.F.T. (MICRONS)	
CARGO HOLD	NO.1 - NO.6 CARGO HOLD	CEILING	STEEL	T/E N/B LIGHT GRAY (125 MIC.)					125	1,938
		WALL	UP TO 1M FROM TANK TOP AT AFT BHD.	T/E N/B LIGHT GRAY (100 MIC.)	T/E N/B LIGHT GRAY (100 MIC.)	(SEE FOLLOWING SKETCH)			200	146
			OTHER PART	T/E N/B LIGHT GRAY (125 MIC.)					125	25,121
		FLOOR (TANK TOP)	FROM AFT BHD. TO 1M FOWARD	T/E N/B LIGHT GRAY (100 MIC.)	T/E N/B LIGHT GRAY (100 MIC.)	(SEE FOLLOWING SKETCH)			200	122
			OTHER PART	T/E N/B LIGHT GRAY (125 MIC.)						3,296
		CONTAINER SUPPORTING STRUCTURE	ENTRY GUIDES	DITTO					125	7,821
			CELL GUIDES, PILLAR, HOR.GIR.	DITTO						
		BILGE WELL	INSIDE	T/E N/B LIGHT GRAY (100 MIC.)	T/E N/B LIGHT GRAY (100 MIC.)				200	132
	HATCH COVER & COAMING			SEE PAGE 60						

EXTENT OF T/E N/B (200 MICRONS) COATED AREA FOR NO.1-NO.6 CARGO HOLD



MITSUI ENGINEERING & SHIPBUILDING CO.,LTD.

16. CARGO HOLD AND TANKS (2/6)

APPLICATION PART		PAINTING SYSTEM		1ST COAT	2ND COAT	3RD COAT	4TH COAT	FINAL COAT	T.D.F.T. (MICRONS)	
CARGO HOLD	ACCESS LADDER IN CARGO HOLD	INCLINED STEEL LADDER	SIDE STRINGER, BOTH SIDE OF TREAD	T/E N/B LIGHT GRAY (125 MIC.)						112
			HAND RAIL	DITTO					125	412
		VERTICAL LADDER	STEEL	DITTO						84
		REST STAGE	STEEL	DITTO						64
HULL CONSTRUCTION TANKS	WATER BALLAST TANKS	DEEP W.BALL.TK, NO.1 BTM W. BALL TK.		T/E RED BROWN (100 MIC.)	T/E BLACK (100 MIC.)		NOTE; BRUSH PAINTING SHALL BE DONE ON WELDED BEADS PRIOR TO SPRAY PAINTING.			5,889
		NO.3,4&5 BTM W.BALL.TKS (S/P)		DITTO	DITTO					12,130
		NO.2 F.& A.W. BALL.TKS.(S/P) NO.4 F.& A.WING W.BALL.TKS (S/P)		DITTO	DITTO				200	14,286
		NO.5 & 6 WING W.BALL.TKS (S/P)		DITTO	DITTO					6,226
		ANTI-HEELING TANKS (S/P), AFT PEAK TANKS (S/P)		DITTO	DITTO					6,991
	FUEL OIL TANKS	NO.3 F.& A. WING F.OIL TKS (S/P)		CK OIL						6,400
		DEEP F.OIL TKS (FR.70-83,S/P)		DITTO						2,893
		F.OIL DRAIN TK (FR.79-83), DIE.OIL TKS (FR.54-79,S) (FR.66-79,P)		DITTO						1,335
		H.F.OIL SETT. TKS (FR.78-83,P/S) H.F.OIL SERV. TKS (FR.78-83,S)		DITTO						1,130
		D.OIL SETT.TK, D.OIL SERV.TK (FR.70-74,P)		DITTO						169
		H.F.OIL SLUDGE TANK, D.OIL SLUDGE TANK (FR.78-80, UNDER 3RD DK)		DITTO						36

MITSUI ENGINEERING & SHIPBUILDING CO.,LTD.

16. CARGO HOLD AND TANKS (3/6)

APPLICATION PART		PAINTING SYSTEM	1ST COAT	2ND COAT	3RD COAT	4TH COAT	FINAL COAT	T.D.F.T. (MICRONS)	
HULL CONSTRUCTION TANKS	LUBE OIL TANKS	BTM RESERVE LUBE O. TK (FR.51-77) BTM LUBE O. SUMP TK (FR.55-76)	CK OIL						658
		S/T LUBE OIL DRAIN TK (FR.29-34)	DITTO						44
		M/E LUBE OIL STOR.TK (FR.62-66,P) CYL.OIL STOR. TK (FR.54-62,S)	DITTO						375
		LUBE OIL SLUDGE TK (FR.80-82 UNDER 3RD DK)	DITTO						43
	FRESH WATER TANKS	NO.1 POTABLE W.TKS (FR.268-279 S/P)	P/E A/C FWT CREAM (70 MIC.)	P/E P/P FWT BLUE (70 MIC.)	P/E P/P FWT WHITE (70 MIC.)				676
		NO.2 POTABLE W.TKS (FR.58-69,S)	DITTO	DITTO	DITTO			210	362
		DIST.WATER TANK (FR.54-58,P)	DITTO	DITTO	DITTO				109
		STERN TUBE COOLING WATER TANK (FR.21-AFT)	T/E RED BROWN (100 MIC.)	T/E BLACK (100 MIC.)					614
	OTHER OIL AND WATER TANKS	SOOT.CLEAN. WATER TANK (FR.54-62,P)	DITTO	DITTO					137
		WASTE OIL TK (FR.70-78,S) CLEAN DRAIN TK (FR.54-62,P)	DITTO	DITTO					206
		BILGE TANK (FR.44-50)	DITTO	DITTO				200	326
	BILGE WELL FOR ENG.RM	FR.21-23, FR.50-54,P/S FR.80-83,P/S	DITTO	DITTO					108
	BILGE WELL FOR FWD MACH.SPACE	FR.266-268	DITTO	DITTO					35
	BILGE WELL FOR CARGO HOLD		SEE PAGE 50						
	CHAIN LOCKER		T/E RED BROWN (100 MIC.)	T/E BLACK (100 MIC.)					575
	AIR PIPE RECESS & SOUNDING PIPE RECESS FOR W.B.TK	IN DOUBLE BOTTOM OF CARGO HOLD	DITTO	DITTO				200	26

MITSUI ENGINEERING & SHIPBUILDING CO.,LTD.

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16. CARGO HOLD AND TANKS (4/6)

APPLICATION PART		PAINTING SYSTEM	1ST COAT	2ND COAT	3RD COAT	4TH COAT	FINAL COAT	T.D.F.T. (MICRONS)	
HULL CONSTRUCTION TANKS	DUCT KEEL	FR.82-194	T/E NB LIGHT GRAY (125 MIC.)					125	3357
	PIPE TRUNK	FR.158-160,P/S FR.178-180,P/S	DITTO						512
	ECHO SOUNDER COMPARTMENT	FR.212-214	T/E RED BROWN (100 MIC.)	T/E BLACK (100 MIC.)				200	12
	ACCESS TRUNK FOR DUCT KEEL	FR.82-83, FR.194-195 OUTSIDE	SAME AS SURROUNDING SPACE						
		FR.82-83, FR.194-195 INSIDE	T/E NB LIGHT GRAY (125 MIC.)					125	178
	VOID SPACE	FORE PEAK TANK	T/E BLACK (100 MIC.)		(NOTE; BRUSH PAINTING SHALL BE DONE ON WELDED BEADS PRIOR TO SPRAY PAINTING.)				1,940
		UNDER FWD. MACH.SPACE (FR.266-287)	DITTO						890
		WING TANKS (FR.230-266, P/S)	DITTO						3,797
		WING TANKS (FR.12-31,P/S)	DITTO					100	3181
		WING TANKS (FR.10-AFT)	DITTO						1,000
		DOUBLE BOTTOM IN ENG RM (FR.62-66,P)	DITTO						75
		INSIDE OF STERN FRAME (FR.13-AFT,2)	DITTO						36
		UNDER SWIMMING POOL	DITTO						75

16. CARGO HOLD AND TANKS (5/6)

APPLICATION PART		PAINTING SYSTEM	1ST COAT	2ND COAT	3RD COAT	4TH COAT	FINAL COAT	T.D.F.T. (MICRONS)	
HULL CONSTRUCTION TANKS	COFFERDAM	FR.21-44. FR.50-78 (IN D. BTM)	T/E BLACK (100 MIC.)					100	1,428
		FR.83-84(P/S), FR.78-83(P/S), FR.78-82(S) (AROUND H.FUEL OIL TANKS) BEHIND INSULAT. FOR H.F.O.TKS	DITTO						270
		COLORED GALVD. SHEET	NO PAINT						
		GLASS CLOTH WITH ALUMIN. FOIL	DITTO						
		BARE STEEL	T/E BLACK (100 MIC.)						1,125
		FR.58-69 (S), (NO.2 P.W.TK UNDER)	DITTO						90
		FR.54-62 (P) (SOOT.CLEAN. W.TK OVER)	DITTO						66
		FR.50-54 (P) (ON 2ND DK)	DITTO						85
		FR.69-70 (S) (ON 2ND DK)	DITTO					100	62
		FR.62-63 (P) FR.69-70 (S) (ON PARTIAL DK)	DITTO						22
		FR.66-70 (P) (ON PARTIAL DK)	DITTO						86
	VERTICAL LADDER AND HAND GRIP IN TANKS		SAME PAINTING SCHEDULE AS TANKS						

16. CARGO HOLD AND TANKS (6/6)

APPLICATION PART			PAINTING SYSTEM	1ST COAT	2ND COAT	3RD COAT	4TH COAT	FINAL COAT	T.D.F.T. (MICRONS)	
LOOSE TANKS	OUTSIDE	STEEL TANKS	LOOSE TANKS ATTACHED ON MACHINERY UNITS	SEE PAGE 81						
			ON EXPOSED WEATHER SPACE	CHR A/C LIGHT GRAY (40 MIC.)	CHR A/C LIGHT GRAY (40 MIC.)	CHR F/P SURROUNDING COLOR (30 MIC.)	CHR F/P SURROUNDING COLOR (30 MIC.)		140	16
			IN MACHINERY AND STORE SPACE	C.A/C LIGHT GRAY (35 MIC.)	C.A/C LIGHT GRAY (35 MIC.)	C.F/P SURROUNDING COLOR (30 MIC.)	C.F/P SURROUNDING COLOR (30 MIC.)		130	24
			IN ENGINE ROOM ABOVE FLOOR PLATE	DITTO	DITTO	DITTO	DITTO			336
			IN ENGINE ROOM BELOW FLOOR PLATE	DITTO	DITTO				70	56
		STAINLESS TANKS		C.F/P SURROUNDING COLOR (30 MIC.)	C.F/P SURROUNDING COLOR (30 MIC.)				60	
	INSIDE	ENGINE ROOM SEWAGE HOLDING TANK (8M3), ECO.CLEANING WATER COLLECT TUB (1.5M3).		T/E RED BROWN (100 MIC.)	T/E BLACK (100 MIC.)				200	32
		FRESH WATER EXPANSION TANK, ATMOS. DRAIN TANK, AIR COOLER CLEAN. WATER TANK		NO PAINT						
		FUEL OIL TANKS, LUBE OIL TANKS DIESEL OIL TANKS, OTHER OIL TANKS		OIL WIPING						
		PURIFIER OPERATING WATER TANK (STAINLESS)		NO PAINT						

17. OUTFITTING AND EQUIPMENT (1/11)

APPLICATION PART		PAINTING SYSTEM		1ST COAT	2ND COAT	3RD COAT	4TH COAT	FINAL COAT	T.D.F.T. (MICRONS)	
ANCHOR AND MOORING FITTING	BOWER ANCHOR, SPARE ANCHOR	CAST STEEL		B/S BLACK (40 MIC.) (PAINTED BY MAKER)	B/S BLACK (40 MIC.)			B/S BLACK (40 MIC.) (IF NECESSARY)	80	48
		SEAT FOR SPARE ANCHOR (STEEL)		CHR A/C LIGHT GRAY (40 MIC.)	CHR A/C LIGHT GRAY (40 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)		140	24
	CHAIN CABLE	EXTRA SPECIAL STEEL		B/S BLACK (40 MIC.) (PAINTED BY MAKER)	B/S BLACK (40 MIC.)			B/S BLACK (40 MIC.) (IF NECESSARY)	80	690
	HAWSE PIPE, CHAIN PIPE.	OUTSIDE	STEEL	SAME AS SURROUNDING SPACE						
		INSIDE	STEEL	T/E BLACK (100 MIC.)					100	34
	TUG BITT (ON SHELL)	OUTSIDE	STEEL	CHR A/C LIGHT GRAY (40 MIC.)	CHR A/C LIGHT GRAY (40 MIC.)	CHR T/S WHITE (30 MIC.)	CHR T/S WHITE (30 MIC.)		140	4
		INSIDE	STEEL	NO PAINT (TOTALLY ENCLOSED SPACE)						
	BOLLARD	OUTSIDE	STEEL	CHR A/C LIGHT GRAY (40 MIC.)	CHR A/C LIGHT GRAY (40 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)		140	64
		INSIDE	STEEL	NO PAINT (TOTALLY ENCLOSED SPACE)						
	CHAIN CONTROLLER, CHAIN STOPPER, DECK ROLLER, UNIVERSAL CHOCK, CLOSED CHOCK, PANAMA CHOCK, OTHER MOORING FITTING	BODY	STEEL	CHR A/C LIGHT GRAY (40 MIC.)	CHR A/C LIGHT GRAY (40 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)			134
		SEAT	OUTSIDE	DITTO	DITTO	DITTO	DITTO		140	68
		SEAT INSIDE	IN CASE OF OPEN TYPE	DITTO	DITTO	DITTO	DITTO			34
		SEAT INSIDE	IN CASE OF TOTALLY ENCLOSED	NO PAINT						
	RAISED BELL MOUTH BOX FOR ANCHOR (ON SHELL)	OUTSIDE	STEEL	CHR A/C LIGHT GRAY (40 MIC.)	CHR A/C LIGHT GRAY (40 MIC.)	CHR T/S BLACK (30 MIC.)	CHR T/S BLACK (30 MIC.)		140	84
		INSIDE	STEEL	T/E BLACK (100 MIC.)					100	272

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17. OUTFITTING AND EQUIPMENT (2/11)

	APPLICATION PART	PAINTING SYSTEM		1ST COAT	2ND COAT	3RD COAT	4TH COAT	FINAL COAT	T.D.F.T. (MICRONS)	
MAST, POST AND DAVIT	FORE MAST, RADAR MAST, AFT MAST	OUTSIDE	STEEL	CHR A/C LIGHT GRAY (40 MIC.)	CHR A/C LIGHT GRAY (40 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)		140	182
		INSIDE	STEEL	NO PAINT (TOTALLY ENCLOSED SPACE)						
		FITTING	INSIDE OF LAMP SEAT	CHR A/C LIGHT GRAY (40 MIC.)	CHR A/C LIGHT GRAY (40 MIC.)	CHR F/P FLAT BLACK (30 MIC.)	CHR F/P FLAT BLACK (30 MIC.)		140	12
		FITTING, OTHER	IN CASE OF STEEL	DITTO	DITTO	CHR F/P AL-GRAY LYKES (30 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)			5
		FITTING, OTHER	IN CASE OF GALVD.	B/C (35 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)			95	5
	JACK STAFF, ENSIGN STAFF	GALVD.		DITTO	DITTO	DITTO				4
	LIGHTING POLE, ANTENNA POST	OUTSIDE	STEEL	CHR A/C LIGHT GRAY (40 MIC.)	CHR A/C LIGHT GRAY (40 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)		140	12
		INSIDE	STEEL	NO PAINT (TOTALLY ENCLOSED SPACE)						
	DAVIT	FOR LIFE BOAT, ACCOMM. LADDER PILOT LADDER		CHR A/C LIGHT GRAY (40 MIC.)	CHR A/C LIGHT GRAY (40 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)		140	102
		FOR FUEL OIL LOADING, SUEZ SEAR. LIGHT HANDLING	IN CASE OF STEEL	DITTO	DITTO	DITTO	DITTO			4
			IN CASE OF GALVD.	B/C (35 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)			95	1
	STORE CRANE			SEE PAGE 80						
	BOAT SKID (BETWEEN BOAT DECK AND FOCSLE DECK)	OUTSIDE	STEEL	CHR A/C LIGHT GRAY (40 MIC.)	CHR A/C LIGHT GRAY (40 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)		140	30
		INSIDE	STEEL	NO PAINT (TOTALLY ENCLOSED SPACE)						

17. OUTFITTING AND EQUIPMENT (3/11)

	APPLICATION PART	PAINTING SYSTEM		1ST COAT	2ND COAT	3RD COAT	4TH COAT	FINAL COAT	T.D.F.T. (MICRONS)	
LADDER, PLATFORM AND HAND RAIL	ACCOMMODATION LADDER	BODY	ALUMINUM ALLOY	NO PAINT						
		UPPER PLATFORM (ON UPP. DECK)	UPPER SURFACE (GALVD)	B/C (35 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)			95	20
			UNDER SURFACE (GALVD)	DITTO	DITTO	DITTO				20
	EXTERIOR INCLINED STEEL LADDER FOR CONTAINER LOADING PLATFORM	SIDE STRINGER	STEEL	I/Z GRAY (75 MIC.)	CHR SEALER GREEN (40 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)				12
		TREAD	UPPER SURFACE (STEEL)	DITTO	DITTO	DITTO				6
			UNDER SURFACE (STEEL)	DITTO	DITTO	DITTO			145	6
	EXTERIOR INCLINED STEEL LADDER FOR EXCEPT ABOVE	SIDE STRINGER	STEEL	DITTO	DITTO	DITTO				44
		TREAD	UPPER SURFACE (STEEL)	DITTO	DITTO	DITTO				28
			UNDER SURFACE (STEEL)	DITTO	DITTO	DITTO				28
		HAND RAIL	GALVD	B/C (35 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)			95	28
	EXTERIOR VERTICAL STEEL LADDER	SIDE STRINGER & STEP	STEEL	I/Z GRAY (75 MIC.)	CHR SEALER GREEN (40 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)			145	10
	CONTAINER LOADING PLATFORM (AROUND HATCH COAMING)	PLATFORM	UPPER SURFACE (STEEL)	CHR A/C LIGHT GRAY (40 MIC.)	CHR A/C LIGHT GRAY (40 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)			112
			UNDER SURFACE (STEEL)	DITTO	DITTO	DITTO	DITTO		140	112
		SUPPORT	STEEL	DITTO	DITTO	DITTO	DITTO			56
		HAND RAIL	TOP RAIL (GALVD)	B/C (35 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)			95	44
			OTHER (STEEL)	CHR A/C LIGHT GRAY (40 MIC.)	CHR A/C LIGHT GRAY (40 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)		140	78

17. OUTFITTING AND EQUIPMENT (4/11)

	APPLICATION PART	PAINTING SYSTEM		1ST COAT	2ND COAT	3RD COAT	4TH COAT	FINAL COAT	T.D.F.T. (MICRONS)	
LADDER, PLATFORM AND HAND RAIL	PLATFORM FOR PILOT HOIST LADDER (ON UPP.DK), OPERATING PLATFORM FOR WINDLASS & MOORING WINCH	PLATFORM	UPPER SURFACE (STEEL)	CHR A/C LIGHT GRAY (40 MIC.)	CHR A/C LIGHT GRAY (40 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)			28
			UNDER SURFACE (STEEL)	DITTO	DITTO	DITTO	DITTO		140	28
		SUPPORT	STEEL	DITTO	DITTO	DITTO	DITTO			40
	EXTERIOR HAND RAIL	ON UPP.DECK, TOP RAIL	GALVD.	B/C (35 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)			95	64
		ON UPP.DECK, MID RAIL, STANCHION & STAY	STEEL	CHR A/C LIGHT GRAY (40 MIC.)	CHR A/C LIGHT GRAY (40 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)		140	124
		ON DECK HOUSE EXTERIOR, TOP RAIL	GALVD.	B/C (35 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)			95	48
		ON DECK HOUSE EXTERIOR, MID RAIL, STANCHION & STAY	STEEL	CHR A/C LIGHT GRAY (40 MIC.)	CHR A/C LIGHT GRAY (40 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)		140	90
	STORM RAIL	ON EXTERIOR WALL ON DECK HOUSE (GALVD)		B/C (35 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)			95	60
	LADDER, PLATFORM AND HAND RAIL	FOR MACHINERY AND STORE SPACE		SEE PAGE 42 & 43						
		FOR ENGINE ROOM AND BOILER SPACE		SEE PAGE 48 & 49						
		FOR CARGO HOLD AND TANKS		SEE PAGE 51 & 56						
LIFESAVING APPLIANCE	LIFESAVING APPLIANCE	LIFE BOAT, LIFERAFT		MAKER'S STANDARD						
		LIFEBUOY, LIFEJACKET, OTHER APPLIANCE		DITTO						
		LIFE BOAT DAVIT		SEE PAGE 57						

17. OUTFITTING AND EQUIPMENT (5/11)

	APPLICATION PART	PAINTING SYSTEM		1ST COAT	2ND COAT	3RD COAT	4TH COAT	FINAL COAT	T.D.F.T. (MICRONS)	
HATCH, MANHOLE AND STEEL DOOR	NO.1-NO.6 HATCH COVER	WEATHER SIDE	STEEL	I/Z * GRAY (75 MIC.)	CHR * SEALER GREEN (40 MIC.)	CHR F/P NON SKID AL-GRAY LYKES (40 MIC.)			155	5,524
		HOLD SIDE	STEEL	T/E NB * LIGHT GRAY (125 MIC.)					125	11,944
		PACKING DITCH	PASTED PART WITH ADHESIVE	I/Z * GRAY (75 MIC.)	NOTE: PAINTS MARKED WITH * SHALL BE APPLIED BY THE SUBCONTRACTOR				75	
			NON PASTED PART	* DITTO						
		TIGHTENING BAR, CLEAT OTHER FITTING	ON HATCH COVER (STEEL)	I/Z * GRAY (75 MIC.)	CHR * SEALER GREEN (40 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)			145	290
			ON HATCH COAMING (STEEL)	CHR A/C LIGHT GRAY (40 MIC.)	CHR A/C LIGHT GRAY (40 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)		140	290
	NO.1-NO.6 HATCH COAMING	OUTSIDE	STEEL	CHR A/C DARY GRAY (40 MIC.)	DITTO	DITTO	DITTO			3,205
		INSIDE (HOLD SIDE)	STEEL	T/E NB LIGHT GRAY (125 MIC.)					125	1,398
		CENTER BOX GIRDER (ON UPP DECK)	OUTSIDE (STEEL)	SAME AS SURROUNDING SPACE						
			INSIDE (STEEL)	C.A/C LIGHT GRAY (35 MIC.)	C.A/C LIGHT GRAY (35 MIC.)				70	845
	ROPE HATCH (2), ESCAPE HATCH (3), ENGINE HATCH ON CASING TOP.	COVER & COAMING	OUTSIDE (STEEL)	CHR A/C LIGHT GRAY (40 MIC.)	CHR A/C LIGHT GRAY (40 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)		140	15
			INSIDE (STEEL)	C.A/C LIGHT GRAY (35 MIC.)	C.WHITE A/C (35 MIC.)	C.F/P WHITE (30 MIC.)			100	15
	FLUSH TYPE BOLTED COVER FOR ENG.RM. (ON UPP.DK)	COVER	UPPER SURFACE (STEEL)	CHR A/C LIGHT GRAY (40 MIC.)	CHR A/C LIGHT GRAY (40 MIC.)	CHR F/P NON SKID STORM GRAY (30 MIC.)			110	8
			UNDER SURFACE (STEEL)	C.A/C LIGHT GRAY (35 MIC.)	C.WHITE A/C (35 MIC.)	C.F/P WHITE (30 MIC.)			100	16
	ACCESS HATCH FOR CARGO HOLD (ON UPP.DK)	COVER & COAMING	OUTSIDE (STEEL)	CHR A/C LIGHT GRAY (40 MIC.)	CHR A/C LIGHT GRAY (40 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)		140	15
			INSIDE (STEEL)	T/E NB LIGHT GRAY (125 MIC.)					125	15

17. OUTFITTING AND EQUIPMENT (6/11)

APPLICATION PART			PAINTING SYSTEM	1ST COAT	2ND COAT	3RD COAT	4TH COAT	FINAL COAT	T.D.F.T. (MICRONS)	
HATCH, MANHOLE AND STEEL DOOR	ACCESS HATCH FOR DUCT KEEL (ON UPP.DK)	COVER & COAMING	OUTSIDE (STEEL)	CHR A/C LIGHT GRAY (40 MIC.)	CHR A/C LIGHT GRAY (40 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)		140	3
			INSIDE (STEEL)	T/E NB LIGHT GRAY (125 MIC.)					125	3
	ACCESS HATCH FOR DUCT KEEL (ON TANK TOP IN ENG.RM)	COVER & COAMING	OUTSIDE (STEEL)	C.A/C LIGHT GRAY (35 MIC.)	C.WHITE A/C (35 MIC.)	C.F/P LIGHT GRAY (30 MIC.)			100	3
			INSIDE (STEEL)	T/E NB LIGHT GRAY (125 MIC.)					125	3
	ACCESS HATCH FOR CO2 BOTT. ROOM (IN BOATSN STORE)	COVER & COAMING	OUTSIDE (STEEL)	CHR A/C LIGHT GRAY (40 MIC.)	CHR A/C LIGHT GRAY (40 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)		140	3
			INSIDE (STEEL)	C.A/C LIGHT GRAY (35 MIC.)	C.WHITE A/C (35 MIC.)	C.F/P WHITE (30 MIC.)			100	3
	MANHOLE COVER	BOTH SURFACE	STEEL	SAME AS SURROUNDING SPACE						
	SIDE PORT DOOR FOR ENG.RM & ACCOMMOD. (ON SHELL)	COVER & COAMING	OUTSIDE (STEEL)	CHR A/C LIGHT GRAY (40 MIC.)	CHR A/C LIGHT GRAY (40 MIC.)	CHR T/S BLACK (30 MIC.)	CHR T/S BLACK (30 MIC.)		140	6
			INSIDE (STEEL)	C.A/C LIGHT GRAY (35 MIC.)	C.WHITE A/C (35 MIC.)	C.F/P WHITE (30 MIC.)			100	12
	ENTRANCE STEEL DOOR ON EXPOSED WEATHER WALL	DOOR & COAMING	WEATHER SIDE (STEEL)	CHR A/C LIGHT GRAY (40 MIC.)	CHR A/C LIGHT GRAY (40 MIC.)	CHR F/P SURROUNDING COLOR (30 MIC.)	CHR F/P SURROUNDING COLOR (30 MIC.)		140	40
		ROOM SIDE	FOR CARGO HOLD	T/E NB LIGHT GRAY (125 MIC.)					125	4
			FOR BATTERY ROOM	P/E A/C GRAY (70 MIC.)	P/E F/P WHITE (70 MIC.)	P/E F/P WHITE (70 MIC.)			210.	2
			FOR OTHER SPACE	C.A/C LIGHT GRAY (35 MIC.)	C.WHITE A/C (35 MIC.)	C.F/P SURROUND. COLOR (30 MIC.)			100	34
	ENTRANCE STEEL DOOR ON INNER WALL (INCLUDING SLIDING DOOR)	DOOR & COAMING (BOTH SIDES)	STEEL SURFACE BEHIND INSULAT.	DITTO					35	12
			GALVD. SHEET (ABOVE INSULAT.)	B/C (35 MIC.)	C.F/P SURROUNDING COLOR (30 MIC.)	C.F/P SURROUNDING COLOR (30 MIC.)			95	12
			BARE STEEL	C.A/C LIGHT GRAY (35 MIC.)	C.WHITE A/C (35 MIC.)	C.F/P SURROUND. COLOR (30 MIC.)			100	80

17. OUTFITTING AND EQUIPMENT (7/11)

APPLICATION PART				PAINTING SYSTEM	1ST COAT	2ND COAT	3RD COAT	4TH COAT	FINAL COAT	T.D.F.T. (MICRONS)	
VENTILATOR	COWLHEAD VENTILATOR FOR CARGO HOLD	HEAD & COAMING		OUTSIDE (STEEL)	CHR A/C LIGHT GRAY (40 MIC.)	CHR A/C LIGHT GRAY (40 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)		140	60
				INSIDE (STEEL)	T/E RED BROWN (100 MIC.)	T/E BLACK (100 MIC.)				200	60
		LOUVER		STEEL	CHR A/C LIGHT GRAY (40 MIC.)	CHR A/C LIGHT GRAY (40 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)			6
		HINGED COVER		OUTSIDE (STEEL)	DITTO	DITTO	DITTO	DITTO		140	6
				INSIDE (STEEL)	DITTO	DITTO	DITTO	DITTO			6
	MUSHROOM VENTILATOR FOR ENGINE ROOM	HEAD & COAMING		OUTSIDE (STEEL)	DITTO	DITTO	CHR F/P AL-GRAY LYKES (30 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)			56
				INSIDE (STEEL)	T/E RED BROWN (100 MIC.)	T/E BLACK (100 MIC.)				200	56
	MUSHROOM VENTILATOR FOR ACCOMMODAT., UNDER DECK PASSAGE, ETC.	HEAD & COAMING	LARGE SIZE	OUTSIDE (STEEL)	CHR A/C LIGHT GRAY (40 MIC.)	CHR A/C LIGHT GRAY (40 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)		140	40
				INSIDE (STEEL)	T/E RED BROWN (100 MIC.)	T/E BLACK (100 MIC.)				200	40
			SMALL SIZE	OUTSIDE (GALVD)	B/C (35 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)			95	20
				INSIDE (GALVD)	NO PAINT						
	GOOSENECK VENTILATOR	BODY		OUTSIDE (GALVD)	B/C (35 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)			95	10
				INSIDE (GALVD)	NO PAINT						
		HINGED COVER		BOTH SIDES (GALVD)	B/C (35 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)			95	2
	SUPPLY & EXHAUST FAN				SEE PAGE 80+81						
	VENTILATION TRUNK				SEE PAGE 67~69						

17. OUTFITTING AND EQUIPMENT (8/11)

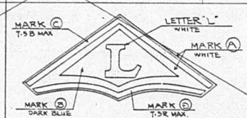
APPLICATION PART				PAINTING SYSTEM	1ST COAT	2ND COAT	3RD COAT	4TH COAT	FINAL COAT	T.D.F.T. (MICRONS)	
VENTILATOR	WALL VENTILATOR FOR CARGO HOLD (ON HATCH COVER SIDE)		COAMING & LOUVER	STEEL	I/Z GRAY (75 MIC.)	CHR SEALER GREEN (40 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)			145	12
			HINGED COVER	OUTSIDE (STEEL)	DITTO	DITTO	DITTO				6
				INSIDE (STEEL)	DITTO	DITTO	DITTO				6
	WALL VENTILATOR FOR OTHER SPACE	LARGE SIZE	COAMING & LOUVER	STEEL	CHR A/C LIGHT GRAY (40 MIC.)	CHR A/C LIGHT GRAY (40 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)		140	4
			HINGED COVER	OUTSIDE (STEEL)	DITTO	DITTO	DITTO	DITTO			2
				INSIDE (STEEL)	DITTO	DITTO	DITTO	DITTO			2
		SMALL SIZE	COAMING & LOUVER	GALVD	B/C (35 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)			95	4
			HINGED COVER	OUTSIDE (GALVD)	DITTO	DITTO	DITTO				2
				INSIDE (GALVD)	DITTO	DITTO	DITTO				2
CONTAINER SUPPORTING & SECURING FITTINGS	FIXED CELL GUIDES FOR NOS.11,12 & 15 BAYS ON WEATHER DECK	PILLAR COMBINED WITH EXHAUST OUTLET FOR ENGINE ROOM	OUTSIDE	(STEEL)	CHR A/C LIGHT GRAY (40 MIC.)	CHR A/C LIGHT GRAY (40 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)		140	110
			INSIDE	DOWN TO 4M INWARD FROM EXPOSED OUTLET	T/E RED BROWN (100 MIC.)	T/E BLACK (100 MIC.)				200	80
				OTHER	C.A/C LIGHT GRAY (35 MIC.)	C.A/C LIGHT GRAY (35 MIC.)				70	40
		PILLAR EXCEPT ABOVE		STEEL	CHR A/C LIGHT GRAY (40 MIC.)	CHR A/C LIGHT GRAY (40 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)	C.? F/P AL-GRAY LYKES (30 MIC.)			
		CELL GUIDE, ENTRY GUIDE & SUPPORT		ON ENG. CASING HOUSE EXTERIOR	DITTO	DITTO	DITTO	DITTO		140	4,438
				OTHER	DITTO	DITTO	DITTO	DITTO			

17. OUTFITTING AND EQUIPMENT (9/11)

APPLICATION PART			PAINTING SYSTEM	1ST COAT	2ND COAT	3RD COAT	4TH COAT	FINAL COAT	T.D.F.T. (MICRONS)	
CONTAINER SUPPORTING & SECURING FITTINGS	ISO DECK SOCKETS, (RASIED TYPE & FLUSH TYPE)	OUTSIDE (STEEL)	ON HATCH COVER	I/Z GRAY (75 MIC.)	CHR SEALER GREEN (40 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)			145	
			ON CONT. POST	DITTO	DITTO	DITTO				
			IN CARGO HOLD	DITTO	T/E NB LIGHT GRAY (125 MIC.)				200	
	D-RING	INSIDE	STEEL	DITTO	(SEE NOTE)				75	
	HATCH COVER LIFTING SOCKETS (ON HATCH COVER)	INSIDE	STEEL	DITTO	CHR SEALER GREEN (40 MIC.)	CHR F/P (30 MIC.)			145	12
		INSIDE	STEEL	DITTO	(SEE NOTE)				75	
				NOTE: AFTER INSTALLATION, DAMAGED PARTS OF I/Z COATING BY WELDING TO BE CLEANED BY WIRE BRUSH OR SIMILAR WAY AND TOUCHED UP WITH TAR EPOXY PAINT (200 MIC.).						
	VERTICAL STACKERS, POSITIONING CONES, UPPER SECURING FITTING, LASHING RODS TURN BUCKLES AND OTHER LOOSE FITTING			SUPPLIED BY THE OWNER						
	CONTAINER PEDESTAL (ON UPPER DECK)	OUTSIDE	STEEL	CHR A/C LIGHT GRAY (40 MIC.)	CHR A/C LIGHT GRAY (40 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)		140	134
		INSIDE	STEEL	NO PAINT (ENCLOSED TYPE)						
	STOWAGE BOXES FOR LOOSE FITTING (ON COAMING SIDE)	OUTSIDE	STEEL	CHR A/C LIGHT GRAY (40 MIC.)	CHR A/C LIGHT GRAY (40 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)		140	130
		INSIDE	STEEL	DITTO	DITTO	DITTO	DITTO			130

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17. OUTFITTING AND EQUIPMENT (10/11)

	APPLICATION PART	PAINTING SYSTEM	1ST COAT	2ND COAT	3RD COAT	4TH COAT	FINAL COAT	T.D.F.T. (MICRONS)	
MARKING	SHIP'S NAME AND PORT OF REGISTRY		(SAME AS SHELL PLATE)				CHR F/P WHITE		6
	FREEBOARD MARKS			DITTO			CHR F/P WHITE		2
	DRAFT MARKS			DITTO			CHR F/P WHITE		10
	SIDE LETTER	"LYKES LINES"	SEE OTHER DRAWING (DWG.NO.4120851 "SHIP SIDE NAME")				CHR F/P WHITE		486
	OWNER'S BOW EMBLEM	LETTER "L" AND MARK (A)	AS GEGARDS THE LOCATION AND MARKING. SEE OTHER DRAWING (DWG.NO.4120852 "BOW MARK")				CHR F/P WHITE		8
		MARK (B)					CHR F/P DARK BLUE		4
		MARK (C)					CHR F/P 7.5 B MAX		2
		MARK (D)					CHR F/P 7.5 R MAX		2
									
	WARNING ILLUSTRATIONS FOR BULBOUS BOW, BOW THRUSTER AND PROPELLER		SEE OTHER DRAWING (DWG.NO.1102179 "BULBOUS BOW MARKS & BOW THRUSTER MARK")				CHR F/P WHITE		1
	TANK BOUNDARY MARKS, TUG PUSHING MARKS		SEE OTHER DRAWING (DWG.NO.2142085 "TANK BOUNDARY MARKS & TUG PUSHING MARK")				CHR F/P WHITE		10
	COMPANY NAME	LETTER "LYKES" (ON BRIDGE FRONT)	SEE OTHER DRAWING (DWG.NO.4120855 "COMPANY NAME ON BRIDGE FRONT")				NIPPE ACRYL ELECTRIC BLUE		118
	STACK INSIGNIA		SEE PAGE 21						

17. OUTFITTING AND EQUIPMENT (11/11)

	APPLICATION PART	PAINTING SYSTEM		1ST COAT	2ND COAT	3RD COAT	4TH COAT	FINAL COAT	T.D.F.T. (MICRONS)	
MISCELLANOUS FITTING	SIDE LIGHT BOXES (ON SECOND TIER)	OUTSIDE	STEEL	CHR A/C LIGHT GRAY (40 MIC.)	CHR A/C LIGHT GRAY (40 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)		140	6
		INSIDE	STEEL	DITTO	DITTO	CHR F/P FLAT BLACK (30 MIC.)	CHR F/P FLAT BLACK (30 MIC.)			6
	TROLLEY (IN DUCT KEEL)	OUTSIDE	STEEL	MAKER'S STANDARD						
		INSIDE	STEEL	C.A/C LIGHT GRAY (35 MIC.)	C.A/C LIGHT GRAY (35 MIC.)				70	6

18. VENTILATION TRUNK (1/3)

	APPLICATION PART	PAINTING SYSTEM			1ST COAT	2ND COAT	3RD COAT	4TH COAT	FINAL COAT	T.D.F.T. (MICRONS)	
IN ACCOMMODATION SPACE	DUCT FOR AIR CONDITIONING	OUTSIDE		UNDER INSULAT (GALVD)	NO PAINT						
				CANVAS ABOVE INSULAT	LATEX PAINT WHITE (30 MIC.)	C.F/P (SURROUNDING COLOR) (30 MIC.)	C.F/P (SURROUNDING COLOR) (30 MIC.)			90	40
		INSIDE		GALVD	NO PAINT						
	NATURAL AND MECHANICAL VENTILATING DUCT	IN CASE OF STEEL DUCT	OUTSIDE	CONCEALED BEHIND LINING & INSULAT.	C.A/C LIGHT GRAY (35 MIC.)	C.A/C LIGHT GRAY (35 MIC.)				70	7
				OTHER VISIBLE PART	DITTO	DITTO	C.F/P (SURROUNDING COLOR) (30 MIC.)	C.F/P (SURROUNDING COLOR) (30 MIC.)		130	7
			INSIDE	DOWN TO 4M INWARD FROM EXPOSED OUTLET/INLET	T/E RED BROWN (100 MIC.)	T/E BLACK (100 MIC.)				200	7
				OTHER	C.A/C LIGHT GRAY (35 MIC.)	C.A/C LIGHT GRAY (35 MIC.)				70	7
		IN CASE OF GALVD DUCT	OUTSIDE	CONCEALED BEHIND LINING & INSULAT.	NO PAINT						
				OTHER VISIBLE PART	B/C (30 MIC.)	C.F/P (SURROUNDING COLOR) (30 MIC.)	C.F/P (SURROUNDING COLOR) (30 MIC.)			90	256
			INSIDE	GALVD	NO PAINT						
	SUPPORT, BOLT & NUT	CONCEALED BEHIND LINIG & INSULATION		IN CASE OF STEEL	C.A/C LIGHT GRAY (35 MIC.)	C.A/C LIGHT GRAY (35 MIC.)				70	1
				IN CASE OF GALVD	NO PAINT						
		OTHER (VISIBLE PART)		IN CASE OF STEEL	C.A/C LIGHT GRAY (35 MIC.)	C.A/C LIGHT GRAY (35 MIC.)	C.F/P (SURROUNDING COLOR) (30 MIC.)	C.F/P (SURROUNDING COLOR) (30 MIC.)		130	1
				IN CASE OF GALVD	B/C (30 MIC.)	C.F/P (SURROUNDING COLOR) (30 MIC.)	C.F/P (SURROUNDING COLOR) (30 MIC.)			90	12

18. VENTILATION TRUNK (2/3)

	APPLICATION PART	PAINTING SYSTEM			1ST COAT	2ND COAT	3RD COAT	4TH COAT	FINAL COAT	T.D.F.T. (MICRONS)	
IN MACHINERY & STORE SPACE	VENTILATING DUCT	IN CASE OF STEEL DUCT	OUTSIDE		C.A/C LIGHT GRAY (35 MIC.)	C.A/C LIGHT GRAY (35 MIC.)	C.F/P WHITE (30 MIC.)	C.F/P WHITE (30 MIC.)		130	18
			INSIDE	DOWN TO 4M INWARD FROM EXPOSED OUTLET/INLET	T/E RED BROWN (100 MIC.)	T/E BLACK (100 MIC.)				200	9
				OTHER	C.A/C LIGHT GRAY (35 MIC.)	C.A/C LIGHT GRAY (35 MIC.)				70	9
		IN CASE OF GALVD DUCT	OUTSIDE		B/C (30 MIC.)	C.F/P WHITE (30 MIC.)	C.F/P WHITE (30 MIC.)			90	157
			INSIDE		NO PAINT						
	SUPPORT, BOLT & NUT	IN CASE OF STEEL			C.A/C LIGHT GRAY (35 MIC.)	C.A/C LIGHT GRAY (35 MIC.)	C.F/P WHITE (30 MIC.)	C.F/P WHITE (30 MIC.)		130	1
		IN CASE OF GALVD			B/C (30 MIC.)	C.F/P WHITE (30 MIC.)	C.F/P WHITE (30 MIC.)			90	8
IN CARGO HOLD	VENTILATING DUCT	OUTSIDE	STEEL		T/E NB LIGHT GRAY (125 MIC.)					125	1,693
		INSIDE	DOWN TO 4M INWARD FROM EXPOSED OUTLET/INLET		T/E RED BROWN (100 MIC.)	T/E BLACK (100 MIC.)				200	84
			OTHER		C.A/C LIGHT GRAY (35 MIC.)	C.A/C LIGHT GRAY (35 MIC.)				70	1,609
	SUPPORT, BOLT & NUT	IN CASE OF STEEL			T/E NB LIGHT GRAY (125 MIC.)					125	} 84
		IN CASE OF GALVD			DITTO						

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18. VENTILATION TRUNK (3/3)

Space	Application Part	Painting System		1st Coat	2nd Coat	3rd Coat	4th Coat	Final Coat	T.D.F.T. (Microns)	
IN ENGINE ROOM & BOILER SPACE	HULL STRUCTURAL DUCT	OUTSIDE		SAME AS SURROUNDING SPACE						
		INSIDE		SEE PAGE 39						
	NATURAL AND MECHANICAL VENTILATING DUCTS	IN CASE OF STEEL DUCT	OUTSIDE	C.A/C LIGHT GRAY (35 MIC.)	C.A/C LIGHT GRAY (35 MIC.)	C.F/P WHITE (30 MIC.)	C.F/P WHITE (30 MIC.)		130	48
		IN CASE OF STEEL DUCT – INSIDE	DOWN TO 4M INWARD FROM EXPOSED OUTLET/INLET	T/E RED BROWN (100 MIC.)	T/E BLACK (100 MIC.)				200	
		IN CASE OF STEEL DUCT – INSIDE	OTHER	C.A/C LIGHT GRAY (35 MIC.)	C.A/C LIGHT GRAY (35 MIC.)				70	48
		IN CASE OF GALVD DUCT	OUTSIDE	B/C (30 MIC.)	C.F/P WHITE (30 MIC.)	C.F/P WHITE (30 MIC.)			90	912
			INSIDE	NO PAINT						
	SUPPORT, BOLT & NUT	IN CASE OF STEEL		C.A/C LIGHT GRAY (35 MIC.)	C.A/C LIGHT GRAY (35 MIC.)	C.F/P WHITE (30 MIC.)	C.F/P WHITE (30 MIC.)		130	2
		IN CASE OF GALVD		B/C (30 MIC.)	C.F/P WHITE (30 MIC.)	C.F/P WHITE (30 MIC.)			90	46

NOTE:
INSIDE SURFACE OF ACCESSIBLE VENTILATING DUCTS SHALL BE TOUCHED UP AFTER FABRICATION.

19. PIPING AND VALVES (1/10)

Space	Application Part	Painting System		1st Coat	2nd Coat	3rd Coat	4th Coat	Final Coat	T.D.F.T. (Microns)	
ON EXPOSED WEATHER PART	AIR VENT PIPE	OUTSIDE	HEAD CAST IRON	CHR A/C LIGHT GRAY (40 MIC.)	CHR A/C LIGHT GRAY (40 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)		140	116
			PIPE (GALVD)	B/C (35 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)			95	20
		INSIDE		NO PAINT						
	HYDRAULIC OIL PIPE FOR DECK MACHINERY	OUTSIDE	STAINLESS STEEL	CHR F/P AL-GRAY LYKES (30 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)				60	160
		INSIDE	STAINLESS STEEL	NO PAINT						
	SHORE CONNECT PIPE FOR F.O., D.O & L.O., OTHER BARE STEEL PIPES	OUTSIDE	STEEL	CHR A/C LIGHT GRAY (40 MIC.)	CHR A/C LIGHT GRAY (40 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)		140	50
		INSIDE	STEEL	NO PAINT						
	COMPRESSED AIR PIPE, FIRE & WASH DECK PIPE, DECK SCUPPER, OTHER GALVD STEEL PIPES	OUTSIDE (GALVD)	ALONG THE DECK HOUSE & MAST	B/C (35 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)			95	} 466
			OTHER	DITTO	CHR F/P AL-GRAY LYKES (30 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)				
		INSIDE		NO PAINT						
	DECK STAND	STEEL		CHR A/C LIGHT GRAY (40 MIC.)	CHR A/C LIGHT GRAY (40 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)		140	20
	VALVES	OUTSIDE	CAST IRON, CAST STEEL	DITTO	DITTO	DITTO	DITTO			28
			CAST BRONZE	NO PAINT						
		INSIDE		DITTO						
	PIPE CLAMPS	GALVD		B/C (35 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)			95	14

19. PIPING AND VALVES (2/10)

Space	Application Part	Painting System		1st Coat	2nd Coat	3rd Coat	4th Coat	Final Coat	T.D.F.T. (Microns)	
ON EXPOSED WEATHER PART	PIPE SUPPORT	IN CASE OF STEEL	ON WEATHER DECK & HATCH COAMING	CHR A/C LIGHT GRAY (40 MIC.)	CHR A/C LIGHT GRAY (40 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)		140	7
			OTHER PART	DITTO	DITTO	CHR F/P AL-GRAY LYKES (30 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)			7
		IN CASE OF GALVD	ON WEATHER DECK & HATCH COAMING	B/C (35 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)			95	7
			OTHER PART	DITTO	CHR F/P AL-GRAY LYKES (30 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)				7
IN ACCOMMODATION SPACE	STEAM PIPE FOR GENER. SERVICE, HOT WATER PIPE, FREON PIPE	OUTSIDE	UNDER INSULAT (COPPER, STEEL)	NO PAINT						
			CANVAS ABOVE INSULAT – IN-VISIBLE PART	DITTO	(INVISIBLE PART MEAN THE PORTION CONCEALED BY LINING & CEILING)					
			CANVAS ABOVE INSULAT – VISIBLE PART	LATEX PAINT WHITE (30 MIC.)	C.F/P WHITE (30 MIC.)	C.F/P WHITE (30 MIC.)			90	10
		INSIDE		NO PAINT						
	POTABLE WATER PIPE, SOIL PIPE, DRAINAGE PIPE, OTHER GALVD STEEL PIPE	OUTSIDE	UNDER DRIP PROOF (GALVD)	DITTO						
			CANVAS ABOVE INSULAT – IN-VISIBLE PART	DITTO	(INVISIBLE PART MEAN THE PORTION CONCEALED BY LINING & CEILING)					
			CANVAS ABOVE INSULAT – VISIBLE PART	LATEX PAINT WHITE (30 MIC.)	C.F/P WHITE (30 MIC.)	C.F/P WHITE (30 MIC.)			90	10
			NON LAGGING (GALVD) – IN-VISIBLE PART	NO PAINT	(INVISIBLE PART MEAN THE PORTION CONCEALED BY LINING & CEILING)					
			NON LAGGING (GALVD) – VISIBLE PART	B/C (35 MIC.)	C.F/P WHITE (30 MIC.)	C.F/P WHITE (30 MIC.)			95	150
		INSIDE		NO PAINT						

19. PIPING AND VALVES (3/10)

Space	Application Part	Painting System		1st Coat	2nd Coat	3rd Coat	4th Coat	Final Coat	T.D.F.T. (Microns)	
IN ACCOMMODATION SPACE	VALVES	OUTSIDE	UNDER INSULATION (BRONZE, CAST IRON)	NO PAINT						
			CANVAS (ABOVE LAGGING)	SAME PAINTING SCHEDULE AS INSULATED PIPE						
			NON LAGGING, NON INSULAT. – CAST IRON	*SAME PAINTING SCHEDULE AS BARE STEEL PIPE						
			NON LAGGING, NON INSULAT. – BRONZE	NO PAINT						
		INSIDE		DITTO						
	PIPE SUPPORT, PIPE CLAMPS	IN CASE OF STEEL	IN-VISIBLE PART	C.A/C LIGHT GRAY (35 MIC.)	C.A/C LIGHT GRAY (35 MIC.)				70	4
			VISIBLE PART	DITTO	DITTO	C.F/P WHITE (30 MIC.)	C.F/P WHITE (30 MIC.)		130	2
		IN CASE OF GALVD	IN-VISIBLE PART	NO PAINT						
			VISIBLE PART	B/C (35 MIC.)	C.F/P WHITE (30 MIC.)	C.F/P WHITE (30 MIC.)			95	2
IN MACHINERY AND STORE SPACE (INCLUDING UNDER DECK PASSAGE)	GENERAL SERVICE STEAM PIPE	OUTSIDE	UNDER INSULAT (STEEL)	NO PAINT						
			GLASS CLOTH (ABOVE LAGGING)	LATEX PAINT WHITE (30 MIC.)	C.F/P WHITE (30 MIC.)	C.F/P WHITE (30 MIC.)			90	125
		INSIDE	STEEL	NO PAINT						
	GARBAGE CHUTE PIPE	OUTSIDE	STEEL	C.A/C LIGHT GRAY (35 MIC.)	C.A/C LIGHT GRAY (35 MIC.)	C.F/P WHITE (30 MIC.)	C.F/P WHITE (30 MIC.)		130	2
		INSIDE	STEEL	P/E A/C FWT CREAM (70 MIC.)	P/E F/P FWT WHITE (70 MIC.)	P/E F/P FWT BLUE (70 MIC.)			210	2

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19. PIPING AND VALVES (4/10)

	APPLICATION PART	PAINTING SYSTEM		1ST COAT	2ND COAT	3RD COAT	4TH COAT	FINAL COAT	T.D.F.T. (MICRONS)	
IN MACHINERY AND STORE SPACE (INCLUDING UNDER DECK PASSAGE)	FRESH WATER PIPE, SCUPPER PIPE, COMPRESSED AIR PIPE, BILGE PIPE, AIR VENT PIPE, SOUNDING PIPE, FIRE & WASH DECK PIPE, OTHER GALVD STEEL PIPE	OUTSIDE	GALVD	B/C (35 MIC.)	C.F/P WHITE (30 MIC.)	C.F/P WHITE (30 MIC.)			95	900
		INSIDE	GALVD	NO PAINT						
	HYD.OIL PIPE, FUEL OIL PIPE, GENERAL SERV. STEAM PIPE (DRAIN), OTHER BARE STEEL PIPES	OUTSIDE	STEEL	C.A/C LIGHT GRAY (35 MIC.)	C.A/C LIGHT GRAY (35 MIC.)	C.F/P WHITE (30 MIC.)	C.F/P WHITE (30 MIC.)		130	350
		INSIDE	STEEL	NO PAINT						
	ALL COPPER PIPES, ALL COPPER-NICKEL PIPES	OUTSIDE		DITTO						
		INSIDE		DITTO						
	VALVES	OUTSIDE	UNDER INSULATION (BRONZE, CAST IRON)	NO PAINT						
		OUTSIDE	CANVAS (ABOVE LAGGING)	SAME PAINTING SCHEDULE AS INSULATED PIPE						
		OUTSIDE, NON LAGGING NOR INSULAT.	CAST IRON	SAME PAINTING SCHEDULE AS BARE STEEL PIPE						
		OUTSIDE, NON LAGGING NOR INSULAT.	BRONZE	NO PAINT						
		INSIDE		DITTO						
	PIPE SUPPORT, PIPE CLAMPS	IN CASE OF GALVD		B/C (35 MIC.)	C.F/P (SURROUNDING COLOR) (30 MIC.)	C.F/P (30 MIC.)			95	20
		IN CASE OF STEEL	ON DECK	C.A/C LIGHT GRAY (35 MIC.)	C.A/C LIGHT GRAY (35 MIC.)	C.F/P STORM GRAY (30 MIC.)	C.F/P STORM GRAY (30 MIC.)		130	20
		IN CASE OF STEEL	ON CEILING & WALL	DITTO	DITTO	C.F/P WHITE (30 MIC.)	C.F/P WHITE (30 MIC.)		130	20

MITSUI ENGINEERING & SHIPBUILDING CO.,LTD.

19. PIPING AND VALVES (5/10)

	APPLICATION PART	PAINTING SYSTEM		1ST COAT	2ND COAT	3RD COAT	4TH COAT	FINAL COAT	T.D.F.T. (MICRONS)	
IN ENGINE ROOM AND SHAFT TUNNEL	EXHAUST GAS PIPE FOR MAIN ENGINE, AUX.BOILER, DIESEL GEN. ENGINE	OUTSIDE	ON EXPOSED WEATHER PART (STEEL)	I/Z GRAY (75MIC.)	(INCLUDING THE PIPES ABOVE FUNNEL TOP)				75	20
		OUTSIDE, ABOVE FLOOR PLATE	UNDER INSULAT (STEEL)	NO PAINT						
		OUTSIDE, ABOVE FLOOR PLATE	GALVD STEEL SHEET	H/R A/P SILVER (25MIC.)	H/R A/P SILVER (25MIC.)				50	62
		OUTSIDE, ABOVE FLOOR PLATE	NON INSULAT (STEEL)	I/Z GRAY (75MIC.)					75	18
		INSIDE		NO PAINT						
	HOT WATER CIRCULATION AND DISTILLED WATER PIPE	OUTSIDE, ABOVE FLOOR PLATE	UNDER INSULAT (COPPER)	DITTO						
		OUTSIDE, ABOVE FLOOR PLATE	GLASS CLOTH (ABOVE LAGGING)	LATEX PAINT WHITE (30 MIC.)	C.F/P EACH DISCRIMINATED COLOUR (30 MIC.)	C.F/P EACH DISCRIMINATED COLOUR (30 MIC.)	(SEE PAGE 11)		90	44
		INSIDE		NO PAINT						
	LUBE OIL PIPE FROM HEATER TO PURIFIER, HEAVY OIL SERV.PIPE, BLENDED OIL SERV. & RETURN PIPE, BOILER W. CIRC.PIPE, CONDENSATE PIPE	OUTSIDE, ABOVE FLOOR PLATE	UNDER INSULAT (STEEL)	DITTO						
		OUTSIDE, ABOVE FLOOR PLATE	GLASS CLOTH (ABOVE LAGGING)	LATEX PAINT WHITE (30 MIC.)	C.F/P EACH DISCRIMINATED COLOUR (30 MIC.)	C.F/P EACH DISCRIMINATED COLOUR (30 MIC.)	(SEE PAGE 11)		90	44
		OUTSIDE, ABOVE FLOOR PLATE	NON INSULAT (STEEL)	C.A/C LIGHT GRAY (35 MIC.)	C.A/C LIGHT GRAY (35 MIC.)	C.F/P EACH DISCRIMINATED COLOUR (30 MIC.)	C.F/P EACH DISCRIMINATED COLOUR (30 MIC.)	(SEE PAGE 11)	130	285
		OUTSIDE, BELOW FLOOR PLATE	UNDER INSULAT (STEEL)	NO PAINT						
		OUTSIDE, BELOW FLOOR PLATE	GLASS CLOTH (ABOVE LAGGING)	LATEX PAINT WHITE (30 MIC.)	C.F/P EACH DISCRIMINATED COLOUR (30 MIC.)	C.F/P EACH DISCRIMINATED COLOUR (30 MIC.)	(SEE PAGE 11)		90	44
		OUTSIDE, BELOW FLOOR PLATE	NON INSULAT (STEEL)	C.A/C LIGHT GRAY (35 MIC.)	C.A/C LIGHT GRAY (35 MIC.)	C.F/P EACH DISCRIMINATED COLOUR (30 MIC.)	C.F/P EACH DISCRIMINATED COLOUR (30 MIC.)	(SEE PAGE 11)	130	285
		INSIDE		NO PAINT						

MITSUI ENGINEERING & SHIPBUILDING CO.,LTD.

19. PIPING AND VALVES (6/10)

	APPLICATION PART	PAINTING SYSTEM		1ST COAT	2ND COAT	3RD COAT	4TH COAT	FINAL COAT	T.D.F.T. (MICRONS)	
IN ENGINE ROOM AND SHAFT TUNNEL	STEAM, STEAM DRAIN AND EXHAUST STEAM PIPE	OUTSIDE, ABOVE FLOOR PLATE	UNDER INSULAT (STEEL)	NO PAINT						
		OUTSIDE, ABOVE FLOOR PLATE	GLASS CLOTH (ABOVE LAGGING)	LATEX PAINT WHITE (30 MIC.)	C.F/P EACH DISCRIMINATED COLOUR (30 MIC.)	C.F/P EACH DISCRIMINATED COLOUR (30 MIC.)	(SEE PAGE 11)		90	44
		OUTSIDE, BELOW FLOOR PLATE	UNDER INSULAT (STEEL)	NO PAINT						
		OUTSIDE, BELOW FLOOR PLATE	GLASS CLOTH (ABOVE LAGGING)	LATEX PAINT WHITE (30 MIC.)	C.F/P EACH DISCRIMINATED COLOUR (30 MIC.)	C.F/P EACH DISCRIMINATED COLOUR (30 MIC.)	(SEE PAGE 11)		90	44
		INSIDE		NO PAINT						
	BALLAST PIPE, FIRE & WASH DECK PIPE, BILGE PIPE, AIR VENT PIPE, DECK SCUPPER, OTHER GALVD STEEL PIPES	OUTSIDE, ABOVE FLOOR PLATE	GALVD	B/C (35 MIC.)	C.F/P EACH DISCRIMINATED COLOUR (30 MIC.)	C.F/P EACH DISCRIMINATED COLOUR (30 MIC.)	(SEE PAGE 11)		95	970
		OUTSIDE, BELOW FLOOR PLATE	GALVD	DITTO	C.F/P EACH DISCRIMINATED COLOUR (30 MIC.)	C.F/P EACH DISCRIMINATED COLOUR (30 MIC.)				
		INSIDE	GALVD	NO PAINT						
	LUBE OIL PIPE, FUEL OIL SUCTION, FILLING & TRANSF.PIPE, MAIN & AUX. COOLING FRESH WATER PIPE, FRESH WATER SERV.PIPE, COMPRESSED AIR PIPE, OTHER BARE STEEL PIPES	OUTSIDE, ABOVE FLOOR PLATE	STEEL	C.A/C LIGHT GRAY (35 MIC.)	C.A/C LIGHT GRAY (35 MIC.)	C.F/P EACH DISCRIMINATED COLOUR (30 MIC.)	C.F/P EACH DISCRIMINATED COLOUR (30 MIC.)	(SEE PAGE 11)	130	570
		OUTSIDE, BELOW FLOOR PLATE	STEEL	DITTO	DITTO	C.F/P EACH DISCRIMINATED COLOUR (30 MIC.)	C.F/P EACH DISCRIMINATED COLOUR (30 MIC.)			
		INSIDE	STEEL	NO PAINT						
	ALL COPER PIPES AND ALL COPPER-NICKEL PIPES	OUTSIDE, ABOVE FLOOR PLATE	COPPER, COPPER/NICKEL	C.F/P EACH DISCRIMINATED COLOUR (30 MIC.)	C.F/P EACH DISCRIMINATED COLOUR (30 MIC.)	(SEE PAGE 11)				
		OUTSIDE, BELOW FLOOR PLATE	COPPER, COPPER/NICKEL	C.F/P EACH DISCRIMINATED COLOUR (30 MIC.)	C.F/P EACH DISCRIMINATED COLOUR (30 MIC.)					
		INSIDE	COPPER, COPPER/NICKEL	NO PAINT						

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19. PIPING AND VALVES (7/10)

	APPLICATION PART	PAINTING SYSTEM		1ST COAT	2ND COAT	3RD COAT	4TH COAT	FINAL COAT	T.D.F.T. (MICRONS)	
IN ENGINE ROOM AND SHAFT TUNNEL	VALVES FOR SEA SUCTION & OVERBOARD DISCHARGE ATTACHED ON SHELL AND COOLING SEA WATER PIPE	OUTSIDE	CAST STEEL	SAME PAINTING SCHEDULE AS BARE STEEL PIPE						
		INSIDE	CAST STEEL	T/E RED BROWN (100 MIC.)	T/E BLACK (100 MIC.)				200	10
	VALVES EXCEPT ABOVE	OUTSIDE	UNDER INSULATION	NO PAINT						
		OUTSIDE	GLASS CLOTH (ABOVE LAGGING)	SAME PAINTING SCHEDULE AS INSULATED PIPE						
		OUTSIDE, NON LAGGING	CAST STEEL	SAME PAINTING SCHEDULE AS BARE STEEL PIPE						
		OUTSIDE, NON LAGGING	BRONZE	NO PAINT						
		INSIDE		DITTO						
	PIPE SUPPORT, PIPE CLAMPS	IN CASE OF STEEL	BELOW FLOOR PLATE	C.A/C LIGHT GRAY (35 MIC.)	C.A/C LIGHT GRAY (35 MIC.)				70	22
		IN CASE OF STEEL, ABOVE FLOOR PLATE	ON DECK	DITTO	DITTO	C.D/P RED L274 (35 MIC.)	C.D/P RED L274 (35 MIC.)		140	22
		IN CASE OF STEEL, ABOVE FLOOR PLATE	ON CEILING & WALL	DITTO	DITTO	C.F/P WHITE (30 MIC.)	C.F/P WHITE (30 MIC.)		130	22
		IN CASE OF GALVD	BELOW FLOOR PLATE	NO PAINT						
		IN CASE OF GALVD, ABOVE FLOOR PLATE	ON DECK	B/C (35 MIC.)	C.D/P RED L274 (35 MIC.)	C.D/P RED L274 (35 MIC.)			105	22
		IN CASE OF GALVD, ABOVE FLOOR PLATE	ON CEILING & WALL	DITTO	C.F/P WHITE (30 MIC.)	C.F/P WHITE (30 MIC.)			95	22

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19. PIPING AND VALVES (8/10)

Area	Application part	Painting system		1st coat	2nd coat	3rd coat	4th coat	Final coat	T.D.F.T (MICRONS)	
IN WATER BALLAST TANK	BALLAST PIPE	OUTSIDE	FRP	NO PAINT						
		INSIDE	FRP	DITTO						
	BILGE PIPE, SOUNDING PIPE, OTHER GALVD STEEL PIPES, BELLMOUTH	OUTSIDE	GALVD	S.W/P YELLOW (7 MIC.)	T/E RED BROWN (100 MIC.)	T/E BLACK (100 MIC.)			207	44
		INSIDE	GALVD	NO PAINT						
	PIPE SUPPORT, PIPE CLAMPS	IN CASE OF GALVD		S.W/P YELLOW (7 MIC.)	T/E RED BROWN (100 MIC.)	T/E BLACK (100 MIC.)			207	2
		IN CASE OF STEEL		T/E RED BROWN (100 MIC.)	T/E BLACK (100 MIC.)				200	2
IN CARGO HOLD	CENTRAL CLEAN.PIPE, BILGE PIPE, AIR VENT PIPE, SOUNDING PIPE, OTHER GALVD STEEL PIPES	OUTSIDE	GALVD	S.W/P YELLOW (7 MIC.)	T/E NB LIGHT GRAY (125 MIC.)				125	176
		INSIDE	GALVD	NO PAINT						
	PIPE SUPPORT, PIPE CLAMPS	IN CASE OF GALVD		S.W/P YELLOW (7 MIC.)	T/E NB LIGHT GRAY (125 MIC.)				132	4
		IN CASE OF STEEL		T/E NB LIGHT GRAY (125 MIC.)					125	2
IN F.O.TK, D.O.TK & L.O.TK	FUEL OIL PIPE, HEATING COIL, SOUNDING PIPE, OTHER BARE STEEL PIPES BELLMOUTH	OUTSIDE	STEEL	NO PAINT						
		INSIDE	STEEL	DITTO						
	PIPE SUPPORT, PIPE CLAMPS	STEEL		DITTO						

MITSUI ENGINEERING & SHIPBUILDING CO.,LTD.

19. PIPING AND VALVES (9/10)

Area	Application part	Painting system		1st coat	2nd coat	3rd coat	4th coat	Final coat	T.D.F.T (MICRONS)	
IN VOID(INCLUD.F.P.TK), DUCT KEEL AND PIPE TRUNK	FUEL OIL PIPE, HEATING COIL FOR F.O.TK	OUTSIDE	UNDER INSULAT (STEEL)	NO PAINT						
		OUTSIDE	GLASS CLOTH (ABOVE LAGGING)	DITTO						
		INSIDE	STEEL	DITTO						
	OTHER PIPES	OUTSIDE	GALVD PIPES	NO PAINT						
		OUTSIDE	BARE STEEL PIPES	C.A/C LIGHT GRAY (35 MIC.)	C.A/C LIGHT GRAY (35 MIC.)				70	60
		INSIDE		NO PAINT						
	VALVES	OUTSIDE	CAST IRON, CAST STEEL	C.A/C LIGHT GRAY (35 MIC.)	C.A/C LIGHT GRAY (35 MIC.)				70	3
		OUTSIDE	BRONZE	NO PAINT						
		INSIDE		DITTO						
	PIPE SUPPORT, PIPE CLAMPS	IN CASE OF GALVD		DITTO						
		IN CASE OF STEEL		C.A/C LIGHT GRAY (35 MIC.)	C.A/C LIGHT GRAY (35 MIC.)				70	3

MITSUI ENGINEERING & SHIPBUILDING CO.,LTD.

19. PIPING AND VALVES (10/10)

Area	Application part	Painting system		1st coat	2nd coat	3rd coat	4th coat	Final coat	T.D.F.T (MICRONS)
IN POTABLE WATER TANK	PIPES, ROSE BOX	OUTSIDE	SUS	NO PAINT					
		INSIDE	SUS	DITTO					
	PIPE SUPPORT, PIPE CLAMPS	STAINLESS STEEL		DITTO					

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20. MACHINERY (1/3)

Area	Application part	Painting system		1st coat	2nd coat	3rd coat	4th coat	Final coat	T.D.F.T (MICRONS)	
GENERAL	MACHINERY	OUTSIDE		SEE PAINTING SCHEDULE DESCRIBED BELOW						
		INSIDE		MAKER'S STANDARD, EXCEPT OTHERWISE SPECIFIED						
ON EXPOSED WEATHER SPACE	WINDLASS, MOORING WINCH	BODY		CHR A/C (40 MIC.)	CHR A/C (40 MIC.)	CHR F/P STROM GRAY (30 MIC.)		CHR F/P STORM GRAY (30 MIC.)		230
		(PREPAINTED BY SUBCONTRACTOR)								
		FOUNDATION	OUTSIDE (STEEL)	T/E HB BLACK (200 MIC.)					200	28
		FOUNDATION	INSIDE (STEEL)	DITTO						56
	WINCH FOR ACCOMMOD. LADDER, PILOT LADDER & LIFE BOAT DAVIT	BODY		CHR A/C (40 MIC.)	CHR A/C (40 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)		CHR F/P AL-GRAY LYKES (30 MIC.)		90
		(PREPAINTED BY SUBCONTRACTOR)								
		SEAT	STEEL	CHR A/C LIGHT GRAY (40 MIC.)	CHR A/C LIGHT GRAY (40 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)		140	12
	STORE CRANE (2)	BODY & JIB		CHR A/C (40 MIC.)	CHR A/C (40 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)		CHR F/P AL-GRAY LYKES (30 MIC.)		30
		(PREPAINTED BY SUBCONTRACTOR)								
		PEDESTAL	OUTSIDE (STEEL)	CHR A/C LIGHT GRAY (40 MIC.)	CHR A/C LIGHT GRAY (40 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)		140	40
		PEDESTAL	INSIDE (STEEL)	C.A/C LIGHT GRAY (35 MIC.)	C.A/C LIGHT GRAY (35 MIC.)				70	40
	SUPPLY FAN FOR CARGO HOLD	CASING	OUTSIDE	CHR A/C (40 MIC.)	CHR A/C (40 MIC.)	CHR F/P AL-GRAY LYKES (30 MIC.)		CHR F/P AL-GRAY LYKES (30 MIC.)		66
		(PREPAINTED BY SUBCONTRACTOR)								
		CASING	INSIDE	T/E BROWN (100 MIC.)	T/E BLACK (100 MIC.)					66
		(PAINTED BY SUBCONT.)								
	BOW THRUSTER IN TUNNEL	BLADE, HUB, HUB CLINDER	AL-BRONZE	NO PAINT						
		CASING, STAY, COVER PLATE, ETC	CARBON STEEL & STEEL PART	P/E GLASS FLAKE (500 MIC.)	V/T SILVER (50 MIC.)	SP A/F PINK (150 MIC.)	SP A/F PLUM (150 MIC.)			6
		(PAINTED BY SUBCONT.)								
		CASING, STAY, COVER PLATE, ETC	STAINL. STEEL PART	V/T SILVER (50 MIC.) (PAINTED BY SUBCONT.)	SP A/F PINK (150 MIC.)	SP A/F PLUM (150 MIC.)				6

MITSUI ENGINEERING & SHIPBUILDING CO.,LTD.

20. MACHINERY (2/3)

APPLICATION PART		PAINTING SYSTEM	1ST COAT	2ND COAT	3RD COAT	4TH COAT	FINAL COAT	T.D.F.T. (MICRONS)	
IN MACHINERY AND STORE SPACE	STEERING GEAR, POWER UNITS FOR DECK MACHINERY, AIR COND. CENTRAL UNITS, AIR COND. REF.UNITS, PUMPS, REFRIGERAT. PLANTS	BODY	C.A/C (35 MIC.) (PREPAINTED BY SUBCONTRACTOR)	C.A/C (35 MIC.)	C.O/R F/P 7.5BG7/2 (30 MIC.)		C.O/R F/P 7.5BG7/2 (25 MIC.)		96
		OIL TANKS — TANKS ATTACHED ON MACHINERY UNITS	DITTO	DITTO	DITTO		DITTO		5
		OIL TANKS — INDEPENDENT TANKS	DITTO	DITTO	DITTO		DITTO		5
		FOUNDATION — ON DCEK — FWD MACH. SPACE, STEER. GEAR RM	C.A/C LIGHT GRAY (35 MIC.)	C.A/C LIGHT GRAY (35 MIC.)	C.O/R F/P STORM GRAY (25 MIC.)			95	10
		FOUNDATION — ON DCEK — OTHER ROOM	DITTO	DITTO	C.D/P STORM GRAY (35 MIC.)			105	32
		FOUNDATION — ON CEILING & WALL	DITTO	DITTO	C.F/P WHITE (30 MIC.)	C.F/P WHITE (30 MIC.)		130	8
	SUPPLY & EXHAUST FANS	CASING — OUTSIDE	C.A/C (35 MIC.) (PREPAINTED BY SUBCONTRACTOR)	C.A/C (35 MIC.)	C.O/R F/P 7.5BG7/2 (30 MIC.)		C.O/R F/P 7.5BG7/2 (25 MIC.)		28
		CASING — INSIDE — WITHIN 4 M FROM EXPOSED OUTLET/INLET	T/E BROWN (100 MIC.) (PAINTED BY SUBCONT.)	T/E BLACK (100 MIC.)					14
		CASING — INSIDE — OTHER	MAKER'S STANDARD						
IN ENGINE ROOM AND SHAFT TUNNEL	MAIN ENGINE	BODY	C.A/C (35 MIC.) (PREPAINTED BY SUBCONTRACTOR)	C.A/C (35 MIC.)	C.O/R F/P 7.5BG7/2 (30 MIC.)		C.O/R F/P 7.5BG7/2 (25 MIC.)		532
		TURBOCHARGER	H/R A/P SILVER (25 MIC.) (PAINTED BY SUBCONT.)	H/R A/P SILVER (25 MIC.)			H/R A/P SILVER (25 MIC.)		98
	ELECT. GENERATING UNITS — SHAFT GENERATOR, EMERGENCY GENERATOR, DIESEL GENERATOR	BODY	C.A/C (35 MIC.) (PREPAINTED BY SUBCONTRACTOR)	C.A/C (35 MIC.)	C.O/R F/P 7.5BG7/2 (30 MIC.)		C.O/R F/P 7.5BG7/2 (25 MIC.)		206
		TURBOCHARGER	H/R A/P SILVER (25 MIC.) (PAINTED BY SUBCONT.)	H/R A/P SILVER (25 MIC.)			H/R A/P SILVER (25 MIC.)		25
	ELECT. GENERATING UNITS — TURBO GENERATOR	BODY	DITTO	DITTO			DITTO		22
	ELECT. GENERATING UNITS — SEAT FOR GENERATOR & TURBINE	BOTH SIDE — STEEL	T/E NB LIGHT GRAY (100 MIC.)	T/E NB LIGHT GRAY (100 MIC.)				200	40

20. MACHINERY (3/3)

APPLICATION PART		PAINTING SYSTEM	1ST COAT	2ND COAT	3RD COAT	4TH COAT	FINAL COAT	T.D.F.T. (MICRONS)	
IN ENGINE ROOM AND SHAFT TUNNEL	MAIN SHAFTING	INTERMEDIATE SHAFT, PROPELLER SHAFT	NO PAINT						
		INTERMEDIATE SHAFT BEARING	(PREPAINTED BY SUBCONTRACTOR)				C.O/R F/P 7.5BG7/2 (25 MIC.)		10
		SEAT FOR BEARING — STEEL	T/E NB LIGHT GRAY (100 MIC.)	T/E NB LIGHT GRAY (100 MIC.)				200	15
	AUXILIARY BOILER, EXHAUST GAS ECONOMIZER, STEAM FLASHER	BODY	(PREPAINTED BY SUBCONTRACTOR)				H/R A/P SILVER (25 MIC.)		230
		SEAT — STEEL	C.A/C LIGHT GRAY (35 MIC.)	C.A/C LIGHT GRAY (35 MIC.)	C.D/P RED L274 (35 MIC.)			105	20
	AUXILIARY MACHINERY AND EQUIPMENT — AIR COMPRESSOR, PUMPS, VENTILATING FANS, LIFTING GEAR, MACHINE TOOL, FRESH WATER GENERATOR, OIL PURIFIER, MISCELLAN. EQUIPMENT	BODY (INCLUDING MOTOR)	(PREPAINTED BY SUBCONTRACTOR)				C.O/R F/P 7.5BG7/2 (25 MIC.)		112
	AUXILIARY MACHINERY AND EQUIPMENT — COOLER, CONDENSER, AIR RESERVOIR	BODY	(PREPAINTED BY SUBCONTRACTOR)				C.F/P WHITE (30 MIC.)		96
	AUXILIARY MACHINERY AND EQUIPMENT — HEATER	BODY	(PREPAINTED BY SUBCONTRACTOR)				H/R A/P SILVER (25 MIC.)		20
	AUXILIARY MACHINERY AND EQUIPMENT — FOUNDATION	STEEL — ON TANK TOP	T/E NB LIGHT GRAY (100 MIC.)	T/E NB LIGHT GRAY (100 MIC.)				200	65
		STEEL — ON PARTIAL DECK	C.A/C LIGHT GRAY (35 MIC.)	C.A/C LIGHT GRAY (35 MIC.)	C.D/P RED L274 (35 MIC.)			105	114
		STEEL — ON CEILING & WALL	DITTO	C.WHITE A/C (35 MIC.)	C.F/P WHITE (30 MIC.)			100	20

21. ELECTRIC EQUIPMENT

APPLICATION PART		PAINTING SYSTEM	1ST COAT	2ND COAT	3RD COAT	4TH COAT	FINAL COAT	T.D.F.T. (MICRONS)	
ELECTRIC EQUIPMENT	STARTER, LIGHTING FIXTURE, SWITCH BOARD, DISTRIBUTION BOARD CONTROL CONSOLE, CONTROL PANEL, RADIO & NAUTICAL EQUIPMENT, OTHER ELECTRIC EQUIPMENT	EXTERIOR SURFACE — IN ACCOMMODAT CABINS, LOUNGES, DINING RMS AND PASSAGEWAY	PREPAINTED BY THE SUBCONTRACTOR (COLOR: TO BE COMPATIBLE WITH THE DECOR OF THE SPACE)						
		EXTERIOR SURFACE — IN OTHER ROOMS AND SPACES	PREPAINTED BY THE SUBCONTRACTOR COLOR: MUNSELL CODE 7.5BG7/2 (EXCEPT THAT THE SPECIAL EQUIPMENT, RADIO EQUIPMENT,ETC.,SHALL BE PAINTED WITH MANUFACTURER'S STANDARD COLORS IF IT IS DIFFICULT TO CHANGE, AFTER CONSULTATION WITH MAKER AND OWNER)						
		INTERIOR SURFACE	MAKER'S STANDARD						
	EMERGENCY DEVICES		PREPAINTED BY THE SUBCONTRACTOR COLOR: MUNSELL CODE 5R4/13						
	GENERATOR, MOTOR		SEE PAGE 81 & 82						
	FOUNDATION	ON EXPOSED WEATHER SPACE — IN CASE OF STEEL	CHR A/C LIGHT GRAY (40 MIC.)	CHR A/C LIGHT GRAY (40 MIC.)	CHR F/P SURROUNDING COLOR (30 MIC.)	CHR F/P SURROUNDING COLOR (30 MIC.)		140	20
		ON EXPOSED WEATHER SPACE — IN CASE OF GALVD	B/C (35 MIC.)	CHR F/P SURROUNDING COLOR (30 MIC.)	CHR F/P SURROUNDING COLOR (30 MIC.)			95	20
		IN ACCOMMODATION SPACE, MACHINERY SPACE AND ENGINE ROOM — IN CASE OF STEEL — ON DECK	C.A/C LIGHT GRAY (35 MIC.)	C.A/C LIGHT GRAY (35 MIC.)	C.D/P SURROUNDING COLOR (35 MIC.)	C.D/P SURROUNDING COLOR (35 MIC.)		140	14
		IN ACCOMMODATION SPACE, MACHINERY SPACE AND ENGINE ROOM — IN CASE OF STEEL — ON CEILING & WALL	DITTO	DITTO	C.F/P WHITE (30 MIC.)	C.F/P WHITE (30 MIC.)		130	34
		IN ACCOMMODATION SPACE, MACHINERY SPACE AND ENGINE ROOM — IN CASE OF GALVD — ON DECK	B/C (35 MIC.)	C.D/P SURROUNDING COLOR (35 MIC.)	C.D/P SURROUNDING COLOR (35 MIC.)			105	14
		IN ACCOMMODATION SPACE, MACHINERY SPACE AND ENGINE ROOM — IN CASE OF GALVD — ON CEILING & WALL	DITTO	C.F/P WHITE (30 MIC.)	C.F/P WHITE (30 MIC.)			95	34

951

1/8

APPROVAL OF OWNER & REGULATORY BODIES

ALT. NO.	OWNER DATE	OWNER LETTER NO.	USCG DATE	USCG LETTER NO.	ABS DATE	ABS LETTER NO.	USPH DATE	USPH LETTER NO.
ORIGINAL	Jan 16 '86	OFFS/MEK - 1154						

FINISHEDPLAN

SHIPYARD AND SHIP'S NO. & NAME

MITSUI TAMANO		MITSUBISHI KOBE	
NO.1323	DOCTOR LYKES	NO.1158	JAMES LYKES
NO.1324	ALMERIA LYKES	NO.1159	JOSEPH LYKES
NO.1325	TILLIE LYKES	NO.1164	SOLON TURMAN

MITSUI ENGINEERING & SHIPBUILDING CO., LTD.
TAMANO WORKS

SHIP DESIGN DEPARTMENT MANAGER — SHIP'S NO. 1325 — SHIP'S NAME TILLIE LYKES

OUTFIT. DESIGN SEC. (PIPING)
SEC. CHIEF
ASST. CHIEF
CHIEF ENGR.
STAFF
DATE (TEL 2240)

PIPE COLOUR IDENTIFICATION SCHEDULE
(HULL PART)

JOB NO. TS1323/24/25 JOBCLASSIF. NO.	SCALE ~	LYKES REF. NO. 190102	MITSUI DRAWING NO. 4116003

(8 SHEETS WITH COVER)

D-60

2/8

PLAN RECORD

ALT. NO.	MARK	ALTERATION/DESCRIPTION	DATE & SIGNATURE
		PREPARED FOR S.1323 AS FINISHED PLAN, MADE APPLICABLE TO S.1324 AND S.1325.	JUNE 30, '86

DWG NO. 4116003 2/8

3/8

GENERAL NOTE

1 THIS PIPE COLOUR IDENTIFICATION SCHEDULE SHALL APPLY TO PIPING POSITIONED IN INTERIOR SPACES EXCEPT FOR ENGINE RM., WHERE NORMALLY VISIBLE (SUCH AS UNDER DECK PASSAGE, ST. GEAR RM., FWD MACH SPACE, A/C UNIT RM., DUCT KEEL AND CO_2 BOTTLE RM.).

DWG. NO. 4116003 3/8

4/8

REFERENCE

NO.	REF. NO.	DWG. NO.	DWG. NAME
1	380304	5131104	COLOUR SCHEDULE OF PIPING IN ENGINE ROOM.
2	480001	4116002	PIPING PRACTICE

DWG. NO.

PIPE & VALVE COLOUR IDENTIFICATION

1. GENERAL

a) IDENTIFICATION OF PIPES SHOULD BE PERFORMED PURSUANT TO OWNER'S STANDARD COLOUR CODING SYSTEM USING ADHESIVE COLOURED TAPES.

b) THE TAPES SHOULD BE POSITIONED AT REGULAR INTERVALS OVER THE PIPE LENGTH ENSURING WHERE PIPES PASS THROUGH BULKHEADS, DECKS AND ETC..

c) A TAPE SHOULD BE POSITIONED ON BOTH SIDES OF PENETRATION.

d) IDENTIFICATION OF PIPES SHALL APPLY TO THE PIPES IN SIZE NOT LESS THAN 15 mm NOMINAL PIPE SIZE.

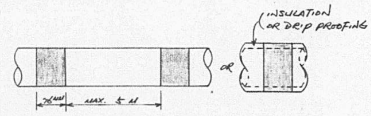
e) POTABLE WATER PIPES, INCLUDING THE FILLING PIPES, SHOULD BE STRIPED WITH 6 INCH (152 mm) LIGHT BLUE BANDS AT INTERVALS NOT TO EXCEED 15 FEET (4.57m) IN ALL SPACES EXCEPT QUATERS, DINING ROOMS, SALONS, AND SIMILAR PUBLIC PLACES WHERE THE DECOR WOULD BE MARRED BY SUCH MARKINGS TO COMPLY USPH REQUIREMENT.

f) VALVE BODY AND HANDLE OR LEVER SHALL BE PAINTED WITH SURROUNDING COLOUR EXCEPT SPECIFIED IN g) BELOW, WHILE NAME PLATE SHOULD BE FITTED FOR EACH VALVE.

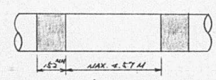
g) IDENTIFICATION OF VALVES FOR FIRE LINE SHOULD APPLY AS FOLLOWS;
VALVE BODY AND HANDLE OR LEVER SHALL BE PAINTED IN THE SAME COLOUR (RED) AS PIPES.

2. DETAILS OF IDENTIFICATION OF PIPES

a) TYPE-1 (PIPES OTHER THAN POTABLE WATER PIPING);



b) TYPE-2 (PIPES FOR POTABLE WATER PIPING);



(USPH requirements)

3. COLOUR IDENTIFICATION

No.	SYSTEM	COLOUR	MUNCEL No.	REMARKS
1	STEAM	SILVER	—	
2	STEAM DRAIN	DARK BLUE	10 B3.5/7.0	
3	FUEL OIL	BLACK	—	
4	DIESEL OIL	TEAK	3.5YR 4/6	
5	LUBE. OIL (INCL. CYL. OIL)	PURPLE & YELLOW	2.5 P 5/5 + 1.5Y 7.5/6	
6	COOL. S.W.	GREEN	8.24Y6.5/5.5	
7	BALLAST WATER	GREEN	8.24Y6.5/5.5	
8	BILGE	GREEN	8.24Y6.5/5.5	
9	POTABLE WATER & HOT WATER	LIGHT BLUE	6.5B4 7/3.5	
10	COMP. AIR (INCL. CONTAIR)	GRAY	N5.5	
11	FIRE	RED	5R 4/13	
12	WASH DECK	—	—	NOT APPLY
13	FRESH WATER	BLUE	10 B 5/10	
14	PNEUMATIC	—	—	NOT APPLY
15	CENTRAL CLEANING	—	—	NOT APPLY

No.	SYSTEM	COLOUR	MUNCEL No.	REMARKS
16	HYD. OIL FOR VALVE REMO-CONT.	—	—	NOT APPLY
17	HYD. OIL FOR DECK MACH.	—	—	NOT APPLY
18	HYD. OIL FOR ST. GEAR	—	—	NOT APPLY
19	HYD. OIL FOR SLIDING DOOR	—	—	NOT APPLY
20	AIR & SOUND.	—	—	NOT APPLY
21	DECK SCUPPER	—	—	NOT APPLY
22	CO_2	—	—	NOT APPLY
23	SOIL & DRAIN	—	—	NOT APPLY
24	FREON	—	—	NOT APPLY

ALT.NO.	OWNER DATE	OWNER LETTER NO.	USCG DATE	USCG LETTER NO.	ABS DATE	ABS LETTER NO.	USPH DATE	USPH LETTER NO.
ORIGINAL	18.12.'85	OFTS/NAB/EE						

APPROVAL OF OWNER & REGULATORY BODIES

FINISHEDPLAN

SHIPYARD AND SHIP'S NO. & NAME

MITSUI TAMANO		MITSUBISHI KOBE	
NO.1323	DOCTOR LYKES	NO.1158	JAMES LYKES
NO.1324	ALMERIA LYKES	NO.1159	JOSEPH LYKES
NO.1325	TILLIE LYKES	NO.1164	SOLON TURMAN

MITSUI ENGINEERING & SHIPBUILDING CO.,LTD.
TAMANO WORKS

SHIP DESIGN DEPARTMENT MANAGER — SHIP'S NO. 1325 — SHIP'S NAME **TILLIE LYKES**

CO-ORDINATION SECTION

TEST PROCEDURE AND RESULT OF IMPRESSED CURRENT CATHODIC PROTECTION SYSTEM

NOV. 10. 1986 SHIP DESIGN DEPARTMENT

DATE (TEL 2223)

JOB NO. TS1323/24/25 — SCALE — LYKES REF. NO. 190502 — MITSUI DRAWING NO. 3106040

(1/23 SHEETS WITH COVER)

TABLE OF CONTENTS

PLAN RECORD

ALT.NO.	MARK	ALTERATION/DESCRIPTION	DATE & SIGNATURE
		PREPARED FOR S NO. 1325 AS FINISHED PLAN.	28TH OCT. 1986

DWG.NO. 3106040

Mitsui Engineering & Shipbuilding Co., Ltd.

Date : FIRST DAY OF SEA TRIAL & 27TH OCT. 1986

Activation :

Owner's or Ship Engineer's Representative : [signature] O.F.T.S.

USCG inspector : (WITNESSED SEATRIAL TEST) [signature]

ABS inspector : [signature] I. WAKUI

Builder's Representative : MES B.A DEPT. T. Katsuura

Maker Representative : [signature]

ABS CONDUCTING INSPECTION ON BEHALF OF USCG AS PER NOU II [signature] USCG

The Nippon Corrosion Engineering Co., Ltd.
Exclusive Right for Sale in
Japan, Far East and S.E. Asia
for
CAPAC System of Engelhard Industries U.S.A.

REV	DATE	DESCRIPTION

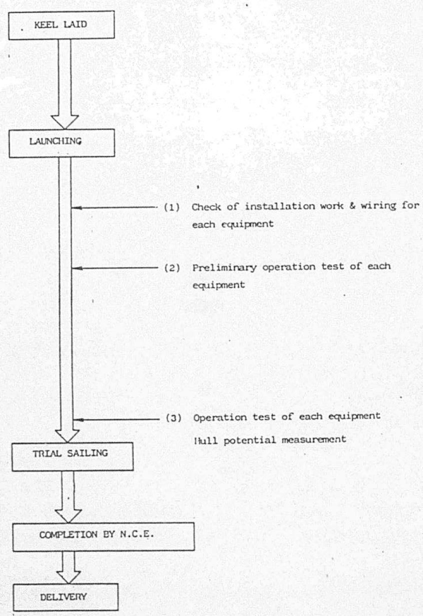
TEST PROCEDURE
of Cathodic Protection by
Automatically Controlled Impressed Current "CAPAC" System
of the ship hull for the TS1325 in commissioning

DATE	Sept. 13, 1985
JOB NO.	66-0396
APPROVED	
CHECKED	[signature]
DRAWN	[signature]
SPEC. NO.	642625-6E
SHEET	4/23

THE NIPPON CORROSION ENGINEERING CO. LTD.
日本防蝕工業株式会社

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Inspection Schedule of "CAPAC" System



(1) Checking Procedures of installation work & wiring for each equipment

o 1A. Check whether each equipment are installed in accordance with the specification.

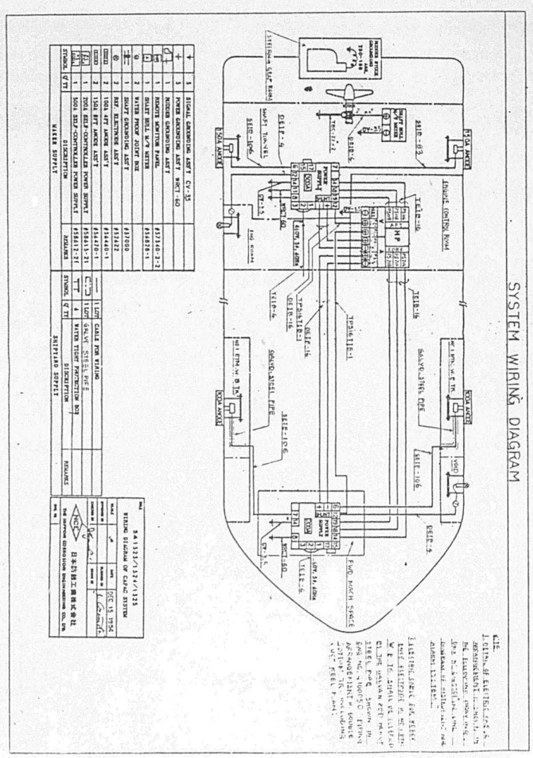
Equipment	Req'd Q'ty	Actual Q'ty	Accept if Checked
o 300A Automatic Power Supply (P/N 58612)	1 unit	1 unit	OK
o 200A Automatic Power Supply (P/N 58613)	1 unit	1 unit	"
o 150A Anode (P/N 36470	2 units	2 units	"
o 100A Anode (P/N 36460-1)	2 units	2 units	"
o Reference Electrode (P/N 32622)	2 units	2 units	"
o Remote Monitor Panel (P/N 72340-2-2)	1 unit	1 unit	"
o Propeller Shaft Grounding Ass.	1 unit	1 unit	"
o Shaft Hull M/Voltmeter & Ammeter (P/N 36828)	1 unit	1 unit	"
o Rudder Post Grounding Ass.	1 unit	1 unit	OK

o 1B. Check for all electrical wiring refer to the specification.

DO NOT USE MEGGER TESTER !

	DWG No. for Wiring	Actual Wiring	Accepted if Checked
o 300A Automatic Power Supply (P/N 58612)	Page 7/23	-Do-	OK
o 200A Automatic Power Supply (P/N 50613)	"	"	"
o Remote Monitor Panel (P/N 72340-2-2)	"	"	"
o Controller Grounding	"	"	"
o Power Supply Grounding	"	"	"
o Propeller Shaft Grounding	"	"	"
o Shaft-Hull M/Voltmeter (P/N 36826)	"	"	"
o Rudder Post Grounding	"	-Do-	OK

SYSTEM WIRING DIAGRAM



(2) Checking Procedures of Preliminary Operation test of Each Equipment

(2.1) Automatic Power Supply

o 2.1A. CABLE CONNECTION

Check for proper connections of all the terminals and tightness of all the fittings.

o 2.1B. ZERO POINT

Set mechanical zero on front panel meters ((M1) , (M2))

o 2.1C. INPUT VOLTAGE

Measure with AC-voltmeter, the ship board power voltage and record it. (Ter. (1), (2) to (3))

o 2.1D. ANODE POTENTIAL

Measure with DC-voltmeter (high impedance), voltage developed between an unenergized platinum anode and a steel hull. (Ter. $^+$(6), $^+$(7), to (8)$^-$ or (11)$^-$)

o 2.1E. REF. ELECTRODE POTENTIAL

(1) Measure with DC-voltmeter, voltage developed between the reference cell lead and the ship hull. (Ter. $^+$(12), to (14)$^-$)

(2) Press REF. CELL CHECK button ((S1)) and record the meter ((M2)) readings.

o 2.1F. MANUAL OPERATION

(1) Place Auto/Manual switch ((S3)) to Manual.

(2) Turn Load circuit breaker ((CB2) - (CB3)) on. Turn Line circuit breaker ((CB1)) on. Manual control setting ((R22)) is full counter-clockwise.

(3) Record the meter ((M1)) readings. Measure with DC-voltmeter, output voltage between the anode and the ship hull. (Ter. $^+$(6), $^+$(7), to (8)$^-$ or (11)$^-$)

(4) Slowly rotate Manual control setting ((R22)) clockwise direction until the meter ((M1)) reads 50 % of max. rating and repeat step (3). (If necessary, Current Limit ((R21)) to be adjusted ...... see item 2.1H)

(5) Slowly rotate Manual control setting ((R22)) full clockwise and repeat step (3).

(6) Turn One Load circuit breaker only on and repeat step (2)~(4).

2.1G. AUTOMATIC OPERATION

(1) Disconnect the control reference cable from terminal No. (12).

(2) Reference cell Simulator lead to ter. +(12) to (14)- and adjust Simulator voltage 0.95 volts.

(3) Place Auto/Manual switch ((S3)) to Automatic.

(4) Turn Load circuit breaker ((CB2) - (CB3)) on.
Turn Line circuit breaker ((CB1)) on.

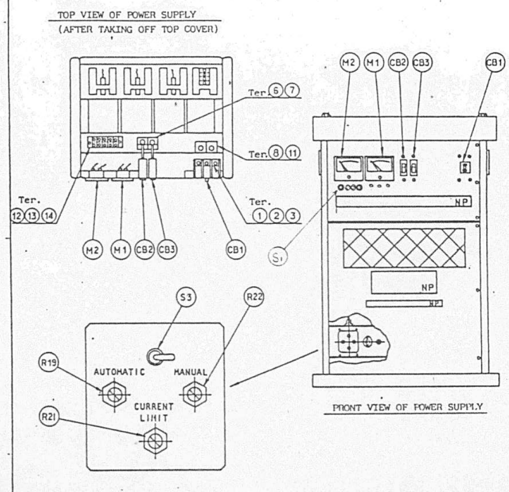
(5) Adjust Automatic control setting ((R19)) until the meter ((M2)) reads 0.85 volts.

(6) Press control ref. cell check button ((S1)) and vary Ref. Cell Simulator voltage 0.85 V to 0.75 V.

(7) Record the meters ((M1), (M2)) readings.

(8) Measure with DC-voltmeter, output voltage between the anodes and the ship hull.
(Ter. +(6) to (8)-)

AUTOMATIC
POWER SUPPLY



DETAIL OF CONTROLLER UNIT

DATA SHEET
(AFT)

(2.1) Automatic Power Supply (P/N 52612), Serial No. 87086

o 2.1A Cable Connection : Req'd condition: Proper connection & Tightness
Actual condition: Proper & Tight
Accept if checked: OK

o 2.1B Zero point : Req'd value: Zero
Actual value: Zero
Accept if checked: OK

o 2.1C Input voltage : Req'd value: 460 V. AC ±10 %
Actual value: (1)-(2) 444 VAC
" ": (2)-(3) 444 VAC
" ": (1)-(3) 444 VAC
Accept if checked: OK

o 2.1D Anode potential : Req'd value: 0.5 - 1.5 V. DC
Actual value: (6)-(8) 0.79 VDC
" ": (7)-(8) 0.79 VDC
" ":
" ":
Accept if checked: OK

o 2.1E Ref. Electrode Potential : Req'd value: Approx. 0.6 V. DC
Actual value: (12)-(14) 0.78 VDC
" ": (13)-(14) -
Accept if checked: OK

* Caution : If the voltage is higher than req'd value, the hull is receiving cathodic protection from some other source. (Zinc or electrical leakage)

DATA SHEET
(AFT)

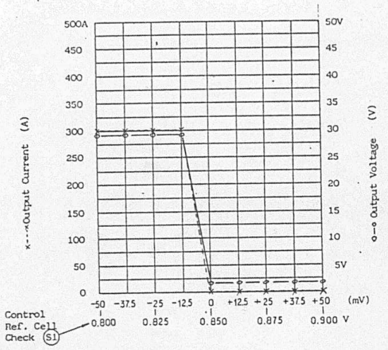
o 2.1F Manual Operation
Req'd value: 10% (30A) of rating or less to 70 % (210A) of rating or higher
Actual Value: 0 ~ 300 Amp.
Accept if checked: OK

Condition of Load NFB	Output Voltage (Ter. +(6) to (8)-) & Current ((M1))	MANUAL CONTROL SETTING (R22) MIN.	HALF	FULL	Remarks
CB2, CB3 ALL ON	Output Voltage	1.5 V	15.8 V	28.6 V	
	Output Current	0 A	150 A	300 A	
CB2 Only ON	Output Voltage	1.7 V	16.5 V		
	Output Current	0 A	75 A		
CB3 Only ON	Output Voltage	1.8 V	16.2 V		
	Output Current	0 A	75 A		

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DATA SHEET
(AFT)

o 2.1G Automatic Operation
Req'd value (30A) 10 % rating or less to 70 % of rating or higher (210A)
Actual value 0 ~ 300 Amp.
Accept if checked OK



Difference voltage between AUTOMATIC CONTRO SETTING (0.85V) and REFERENCE CELL SIMULATOR VOLTAGE

2.1H CURRENT LIMIT

· (Current limit adjust is factory preset for rated output current.
If necessary, it can be adjusted for any needed output.)

(1) Place Auto/Manual switch (S3) to Manual.
(2) Rotate Current limiting control (R21) full counter-clockwise.
(3) Rotate Manual control setting (R22) full clockwise.
(4) Slowly rotate current limiting control (R21) clockwise and adjust it until the output current becomes maximum rated current.

DATA SHEET

o 2.1H Current Limit
Req'd value : (210A) 70 % of rating or higher
Actual value : 300 Amp.
Accept if checked: OK

CAUTION:

AAA. When the ship is in fresh or brackish water, the rated output current cannot flow from anode into water because of high resistivity of fresh or brackish water. In this case, the current limit can not be adjusted.

BBB. As in the case of the newly painted ship, when the paint system of the ship hull is quite good and resistivity of cathode (hull) is very high, the output current from Anode will often be less than the rated output current. In such case, the Current Limit Control shall be adjusted at full clockwise position.
Several years later when the ship's painting system is somewhat deteriorated, the Current Limit Control shall again be adjusted for proper output current.

DATA SHEET
(FWD)

(2.1) Automatic Power Supply (P/N 58613), Serial No. 84099

o 2.1A Cable Connection : Req'd condition Proper connection & Tightness
Actual condition Proper & Tight
Accept if checked OK

o 2.1B Zero point : Req'd value Zero
Actual value Zero
Accept if checked OK

o 2.1C Input voltage : Req'd value 460 V. AC ±10 %
Actual value ①-② 471 VAC
" " ②-③ 471 VAC
" " ①-③ 471 VAC
Accept if checked OK

o 2.1D Anode potential : Req'd value 0.5 - 1.5 V. DC
Actual value ⑥-(A) 1.2 VDC
" " ⑦-(A) 0.9 VDC
" "
" "
Accept if checked OK

o 2.1E Ref. Electrode Potential : Req'd value Approx. 0.6 V. DC
Actual value ⑫-⑭ 0.71 VDC
" " ⑬-⑭ –
Accept if checked OK

* Caution : If the voltage is higher than req'd value, the hull is receiving cathodic protection from some other source. (Zinc or electrical leakage)

DATA SHEET
(FWD)

o 2.1F Manual Operation
Req'd value (20A) 10% of rating or less to 70 % of rating or higher (140A)
Actual Value 0 ~ 200 Amp.
Accept if checked OK

Condition of Load NFB	Output Voltage (Ter. *⑥ to ⑧) & Current (M1)	MANUAL CONTROL SETTLING (R22) MIN.	HALF	FULL	Remarks
CB2, CB3 ALL ON	Output Voltage	2.0 V	17.3 V	30.3 V	
	Output Current	0 A	100 A	200 A	
CB2 Only ON	Output Voltage	2.3 V	16.9 V		
	Output Current	0 A	50 A		
CB3 Only ON	Output Voltage	2.4 V	16.5 V		
	Output Current	0 A	50 A		

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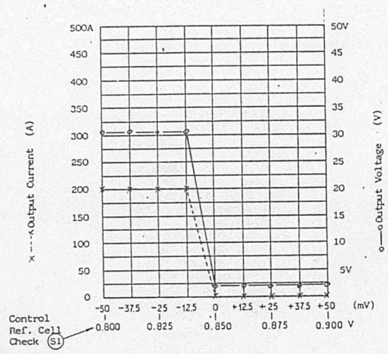
DATA SHEET
(FWD)

o 2.1G Automatic Operation

Req'd value (20A) 10 % rating or less to (140A) 70 % of rating or higher

Actual value 0 ~ 200 Amp.

Accept if checked OK



Difference voltage between AUTOMATIC CONTRO SETTING (0.85V) and REFERENCE CELL SIMULATOR VOLTAGE

2.1H CURRENT LIMIT

(Current limit adjust is factory preset for rated output current. If necessary, it can be adjusted for any needed output.)

(1) Place Auto/Manual switch ((S3)) to Manual.
(2) Rotate Current limiting control ((R21)) full counter-clockwise.
(3) Rotate Manual control setting ((R22)) full clockwise.
(4) Slowly rotate current limiting control ((R21)) clockwise and adjust it until the output current becomes maximum rated current.

DATA SHEET

o 2.1H Current Limit

Req'd value	:	(140A) 70 % of rating or higher
Actual value	:	200 Amp.
Accept if checked:		OK

CAUTION:

AAA. When the ship is in fresh or brackish water, the rated output current cannot flow from anode into water because of high resistivity of fresh or brackish water. In this case, the current limit can not be adjusted.

BBB. As in the case of the newly painted ship, when the paint system of the ship hull is quite good and resistivity of cathode (hull) is very high, the output current from Anode will often be less than the rated output current. In such case, the Current Limit Control shall be adjusted at full clockwise position. Several years later when the ship's painting system is somewhat deteriorated, the Current Limit Control shall again be adjusted for proper output current.

(2.2) Remote Monitor Panel (P/N 72340-X-X)

2.2A. CABLE CONNECTION

Check for Proper connections of all terminal tight of all the fittings.

2.2B. ZERO POINT

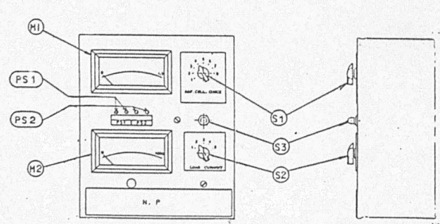
Set mechanical zero on front Panel Meters.

2.2C. LIGHTING TEST FOR ALARM INDICATOR LIGHTS

Re ALARM INDICATOR,LIGHTS fitted on the Remote Monitor Panel, do they show the similar status of glow as the INDICATOR LIGHT fitted on the Panel Surface of FORE/AFT POWER SUPPLY ?

2.2D. METER CALIBRATION

Adjust each small resistor on the terminal block assembly mounted inside the Remote Monitor Panel, so that the reading of (M2) is equal on the Ammeter of Power Supply.



DATA SHEET

(2.2) Remote Monitor Panel (P/N 72340-X-X)

o 2.2A Cable Connection : Req'd condition Proper Connection & Tightness
Actual condition Proper & Tight
Accept if checked OK

o 2.2B Zero Point : Req'd condition Zero
Actual condition Zero
Accept if checked OK

o 2.2C Lighting Test for Alarm Indicator Lights : Req'd condition (AFT) Green Light ON, Red Light ON
Actual condition (PS1) Green Light , ON
Red Light ON
Req'd Condition (FORE) Green Light ON, Red Light ON
Actual condition (PS2) Green Light , ON
Red Light ON
Accept if checked OK

o 2.2D METER CALIBRATION : Meter readings of FORE and AFT POWER SUPPLY
FORE 200 A
AFT 300 A

Meter (M2) readings of Remote Monitor Panel Indicater & Ammeter. Position of rotary selection Switch (PS1) 200 A
(PS2) 300 A

Accept if checked OK

(2.3) Shaft-Hull M/Voltmeter (P/N3682#)

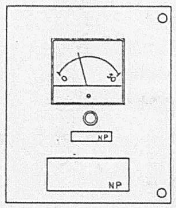
2.3A. CABLE CONNECTION

Check for proper connections of all the terminals and tightness of all the fittings.

2.3B. ZERO POINT

Set mechanical zero on front panel meter.

(FRONT VIEW)



DATA SHEET

2.3A. Cable connection :	Req'd condition	Proper connection & Tightness
	Actual condition	Proper & Tight
	Accept if checked	OK
2.3B. Zero point :	Req'd value	Zero
	Actual value	Zero
	Accept if checked	OK

(3) Checking Procedures of Operation test of Each Equipment

The following measurement should be performed.

o 3A. o Place Auto/Manual switch (S3) to Automatic.

o Turn Load circuit breaker (CB2 - CB5) & line circuit breakers (CB1) ON of Power Supply.

o Adjust Automatic control setting (R19) until meter (M2) reads 0.85 volts.

o Press Control & Aux. reference cell check button (S1) and record the meter (M2) readings.

o Record the meter (M1) readings.

DATA SHEET

Date: Oct. 20th, 1986 & Oct. 27th, 1986

o 3A. Check the automatic operation Inspector : [signature]

Req'd value (Ref. Cell Check readings) : 0.80V - 0.90V

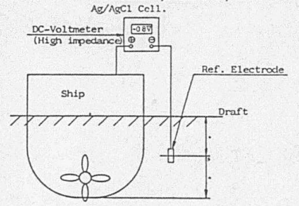
Actual value (AFT): 0.85V , (FWD) 0.85V

Accept if checked OK

DATE	Ship's Location	(AFT) Auto Cont. Setting A	Ref. Cell Check B Cont.	Ref. Cell Check C Aux.	Anode Current D	(FWD) Auto Cont. Setting A	Ref. Cell Check B Cont.	Ref. Cell Check C Aux.	Anode Current D	(S/H mV) Auto Cont. Setting A	Ref. Cell Check B Cont.	Ref. Cell Check C Aux.	Anode Current D
10/20		0.85	0.85		42	0.85	0.85		OFF ~~15~~				32
10/27		0.85	0.85		7	0.85	0.85		15				—

HULL POTENTIAL MEASUREMENT

o 3.B Measure the protective potential of the hull with a portable Ag/AgCl Cell.



* Method of potential survey :

By portable potential meter, in combination with reference cell and ground contact the degree of effectiveness of the cathodic protection system can be surveyed.

Drop the reference cell into the water close to the hull which is cathodically protected. The clamped grounding contact must be firmly made to the steel through any paint or rust to make a good electrical contact to the hull.

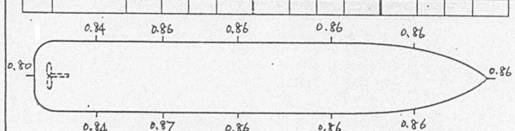
DATA SHEET

o 3.B Hull Potential measurement: Req'd value -0.78V or less

Actual value -0.80 ~ -0.87 V

Accept if checked OK

DATE	Ship's Location	Auto Cont. Setting A	Ref. Cell Check B Cont.	Ref. Cell Check C Aux.	Anode Current D	Auto Cont. Setting A	Ref. Cell Check B Cont.	Ref. Cell Check C Aux.	Anode Current D	Auto Cont. Setting A	Ref. Cell Check B Cont.	Ref. Cell Check C Aux.	Anode Current D
10/20		0.85	0.85	–	34	0.85	0.85	–	15				



KIND OF REF. ELECTRODE	SKETCH (AROUND 20M) OF ANCHORING POSITION
Ag/AgCl	
SEA WATER TEMPERATURE	

959

APPROVAL OF OWNER & REGULATORY BODIES

ALT. NO.	OWNER DATE	OWNER LETTER NO.	USCG DATE	USCG LETTER NO.	ABS DATE	ABS LETTER NO.	USPH DATE	USPH LETTER NO.
ORIGINAL	15 MAR. '85	OFT/MES/126			Mar. 1 '85	File Ref: T-8-2		
2ND REV	26 MAY '86	OFTS/HES-447			2 JUN '86	T-8-2		
1ST PART REV	14 AUG '86	TAM/39			4 OCT '86	T-8-2		
2ND PART REV	8 SEP '86	TAM/63			9 OCT '86	T-8-2		
3RD PART REV	8 SEP '86	TAM/63			16 OCT '86	T-8-2		
4TH PART REV	16 NOV '86	TAM/115			18 DEC '86	T-8-2		
5TH PART REV	27 MAR '86	TAM/160			2 APR '86	T-8-2		

FINISHEDPLAN

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SHIPYARD AND SHIP'S NO. & NAME			
MITSUI TAMANO		MITSUBISHI KOBE	
NO.1323	DOCTOR LYKES	NO.1158	JAMES LYKES
NO.1324	ALMERIA LYKES	NO.1159	JOSEPH LYKES
NO.1325	TILLIE LYKES	NO.1164	SOLON TURMAN

MITSUI ENGINEERING & SHIPBUILDING CO., LTD.
TAMANO WORKS

SHIP DESIGN DEPARTMENT
MANAGER
STRUCTURE DESIGN SEC.
SEC. CHIEF
STAFF N. Fukuda
DATE (TEL 2230)

SHIP'S NO. 1325
SHIP'S NAME TILLIE LYKES

舵及舵頭材
RUDDER & RUDDER STOCK

JOB NO. TS1323/24/25
JOBCLASSIF. NO. B 04
SCALE 1/50, 1/25, 1/20, 1/20
LYKES REF. NO. 220003
MITSUI DRAWING NO. 2104301

(22 SHEETS WITH COVER)

PLAN RECORD

ALT. NO.	MARK	ALTERATION/DESCRIPTION	DATE & SIGNATURE
		"PREPARED FOR S.NO.1323 AS FINISHD PLAN, MADE APPLICABLE TO S.NO.1324 AND S.NO.1325"	NOV. 28. '86

DWG. NO. 2104301 - 1/

PRINCIPAL PARTICULARS

LENGTH	(P.P.)	(L_{pp})	245.00 M
		(L_{scant})	241.627 M
BREADTH	(MLD)	(B)	32.20 M
DEPTH	(MLD)	(D)	18.80 M
DRAFT	(MLD)	(d)	11.38 M
TOTAL RUDDER AREA	(WITH HORN)	(A')	65.96 M^2
TOTAL RUDDER AREA	(WITHOUT HORN)	(A)	54.16 M^2
RUDDER AREA	(FWD OF TURNING AXIS)	(A_f)	13.59 M^2
RUDDER AREA	(AFT OF TURNING AXIS)	(A_a)	40.57 M^2
RUDDER AREA RATIO		($A'/L_{pp} \cdot d$)	1/44.13
BALANCING RATIO		(A_f/A)	0.251
ASPECT RATIO		(h/ℓ)	ABT. 1.426
RUDDER DESIGN SPEED	(FULL LOAD AT MCR)		22.8 KT
WORKING ANGLE OF RUDDER	(MAX.)		35°

NOTE:

1. ABS CERTIFICATION TO BE REQUIRED FOR ◎ ITEMS.
2. APPROVED LOW-HYDROGEN ELECTRODES TO BE USED FOR INITIAL SEVERAL BEADS OF FABRICATION AND PRODUCTION WELDS.
3. IN CASE OF WELDING OF CASTING AND HEAVY PLATING (CAST TO STEEL) WELDING JOINT TO BE SUITABLY PRE-HEATED PRIOR TO WELDING AND LOW-HYDROGEN ELECTRODES TO BE USED.
4. RUDDER TIGHTNESS TO BE TESTED BY THE COMPRESSED AIR. (PRESSURE 0.5 KG/CM^2)
5. CASTING & FORGING TO BE INSPECTED WITH MAGNAFLUX OR ULTRASONIC.
6. ALL CASTING TO BE ANNEALED BUT FABRICATED BLOCKS TO BE AS WELD.
7. FOR COATING OF INTERIOR SURFACES, SEE "PAINTING SCHEDULE" (DWG. NO 3101001)
8. GRADE OF PLATES TO BE AS FOLLOWS.
   - $t \leq 12.5$ --- AAM (GRADE "A" RIMMED)
   - $t = 20, 25, 30$ --- AAS (GRADE "A" SEMI-KILLED)
   - $t = 40$ --- ABS (GRADE "B" SEMI-KILLED)
   - $t = 55$ --- ADN (GRADE "D" KILLED & NORMALIZED)
9. THIS RUDDER IS DESIGNED TO ENABLE EASE OF INWATER SURVEY.
10. MACHINING MARK & SURFACE ROUGHNESS:

UNIT (MICRON)

MACHINING MARK & SURFACE ROUGHNESS:		▽▽▽	▽▽	▽	~
MACHINING MARK	DIA. (MM)				
ROUND SURFACE	0- 20	1.6-S	12-S	35-S	
	21- 200	3.0-S	12-S	35-S	
	201- 500	3.0-S	12-S	50-S	
	501- 750	6.0-S	18-S	100-S	
	751-1000	6.0-S	25-S	200-S	
FLAT SURFACE		6.0-S	12-S	35-S	

IN CASE THAT THE SURFACE ROUGHNESS GRADE IS DIFFERENT FROM THE ABOVE, THE MACHINING MARK TO BE ACCOMPANIED BY THE SPECIFIED SUFACE ROUGHNESS.

960

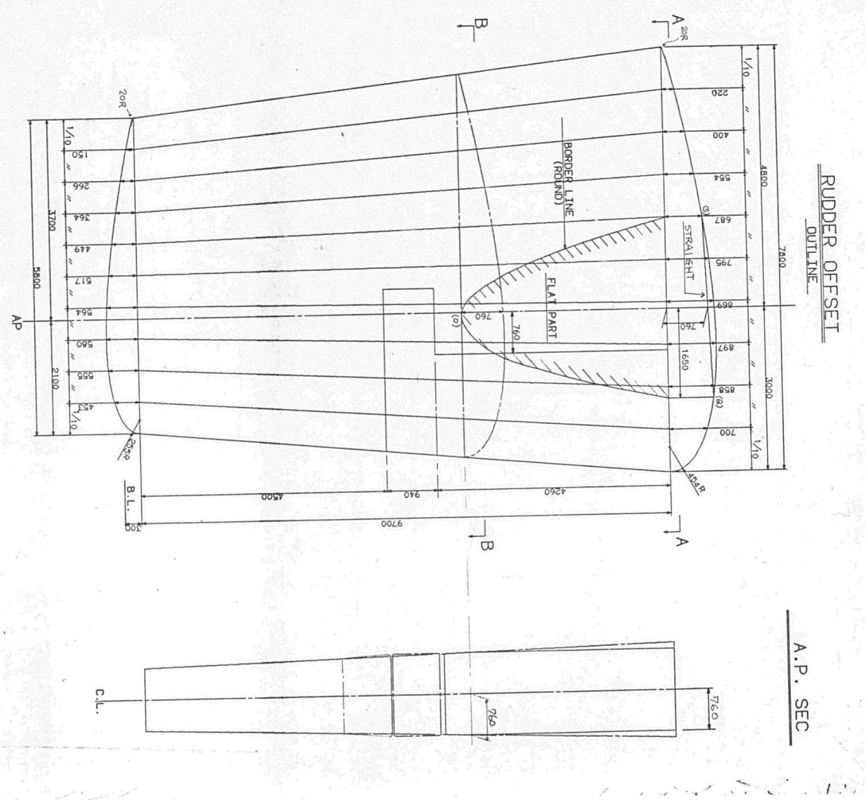
MATERIAL LIST

	ITEM	MATERIAL	NO	WT(TON) (ABT)	SHOP	ARR. NO
①	RUDDER ASSEMBLY (PLATE)	ABS STEEL	1			
②	RUDDER STOCK	(INGOT FORGED) SF45 (MAX.C=0.23%)	1			
③	UPPER RUDDER FRAME	SC42 (MAX.C=0.20%)	1			
④	LOWER RUDDER FRAME	SC42 (MAX.C=0.20%)	1			
⑤	STOPPER (FOR REAMER BOLTS)	SS41	2			
⑥	170ϕ REAMER BOLT & NUT	SF45	6			
⑦	UPP. RUDD. PINTLE & NUT	SF45	1			
⑧	LOW. RUDD. PINTLE & NUT	SF45	1			
⑨	(FOR REAMER BOLT) R.B. NUT STOPPER	SS41	6			
⑩	(FOR UPP. PINTLE) WASHER	SS41	1			
⑪	(FOR LOW. PINTLE) WASHER	SS41	1			
⑫	(FOR UPP. PINTLE) SLEEVE	(STAINLESS ST.) SUS 316L	1			
⑬	(FOR LOW. PINTLE) SLEEVE	(STAINLESS ST.) SUS 316L	1			
⑭	(FOR UPP. PINTLE) PINTLE LOCKING PIECE	SS41	1			
⑮	(FOR LOW. PINTLE) PINTLE LOCKING PIECE	SS41	1			
⑯	(FOR UPP. PINTLE) PINTLE NUT STOPPER	SS41	1			
⑰	(FOR LOW. PINTLE) PINTLE NUT STOPPER	SS41	1			
⑱	(FOR UPP. PINTLE) EYE (25ϕ R.B)	SS41	1			
⑲	(FOR LOW. PINTLE) EYE (50ϕ R.B)	SS41	1			
⑳	(FOR UPP. PINTLE) 18ϕ PACK. RING (NUT)	(HARDNESS 45±5) SYNTHETIC RUBBER	1			
21	(FOR UPP. PINTLE) 16ϕ PACK. RING (SLEEVE)	(HARDNESS 45±5) SYNTHETIC RUBBER	1			
22	(FOR LOW. PINTLE) 18ϕ PACK. RING (NUT)	(HARDNESS 45±5) SYNTHETIC RUBBER	1			
23	(FOR LOW. PINTLE) 18ϕ PACK. RING (SLEEVE)	(HARDNESS 45±5) SYNTHETIC RUBBER	1			
24	FILLING & DRAIN FLANGE	SS41	3			
25	FILLING & DRAIN PLUG	(STAINLESS ST.) SUS304	3			
26	PACKING (FOR PLUG)	SYNTHETIC RUBBER (NEOPRENE SHORE HARDNESS 60)	3			
27	LIFTING STOPPER	(STAINLESS ST.) SUS 304	2			
28	(FOR SLOT WELD) NAX BODY FILLER	POLYESTER RESIN	1			
29	(FOR RUDDER STOCK) EYE PLATE	SS41	1			
30	(FOR HANHOLE & COVER PL) M24 COUNTERSUNK BOLT	SUS 304	8			
31	(FOR COVER PL) BOLTS & NUTS (M24)	SUS 304	4 [illegible]			

MATERIAL LIST

	ITEM	MATERIAL	NO	WT(TON) (ABT)		
32	(FOR HANDHOLE & COVER PL.) COV. PL. FRAME	SUS 304	2			
33	(FOR OBSERVATION WINDOW) 100ϕ WINDOW	TOUGHENED GLASS	2			
34	(FOR OBSERVATION WINDOW) M12 COUNTERSUNK HEAD BOLT	SUS 304	16			
35	(FOR OBSERVATION WINDOW) WINDOW FRAME	SUS 304	2			
36	(FOR OBSERVATION WINDOW) HOLD PIECE	SS41	2			
37	(FOR OBSERVATION WINDOW) PACKING	SYNTHETIC RUBBER (NEOPRENE)	4			
38	(FOR UPP. PINTLE) PINTLE NUT FASTENING CHECK BAR	SUS 304	1SET			
39	(FOR LOW. PINTLE) PINTLE NUT FASTENING CHECK BAR	SUS 304	1SET			

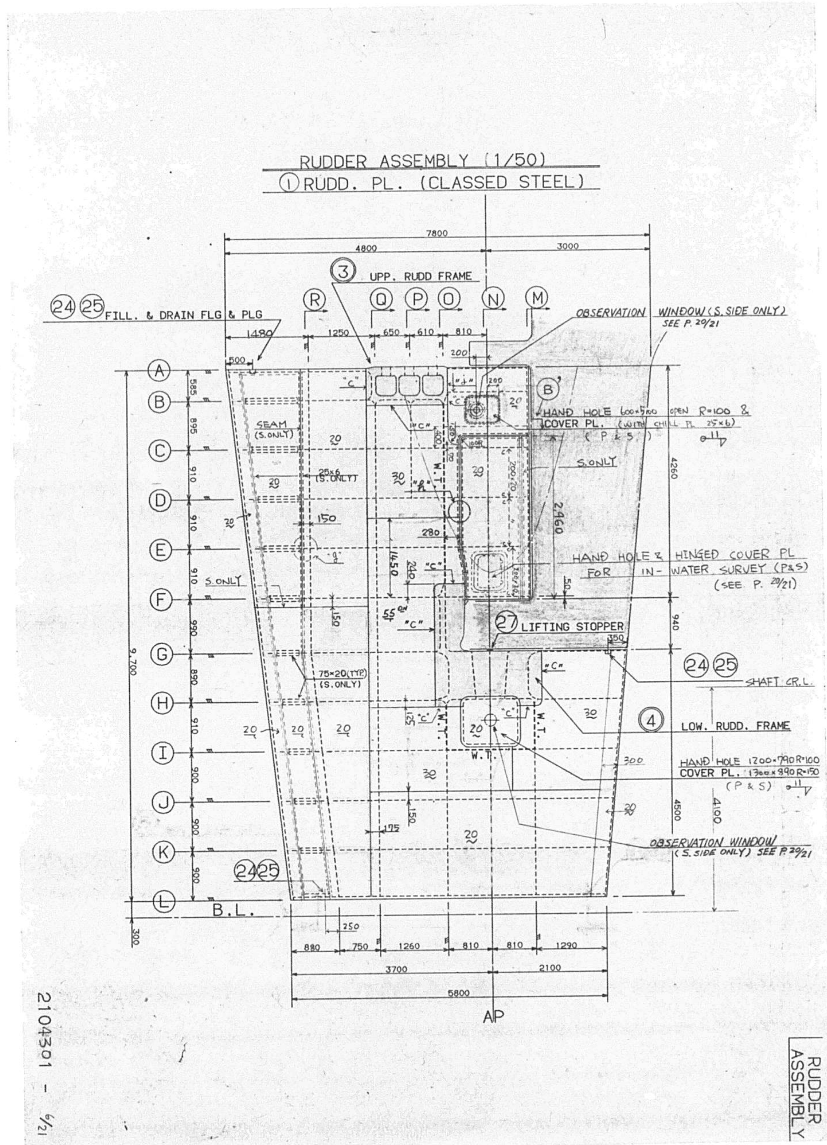
TOTAL WEIGHT ABT. 70.4 TON
(EXCLUDING RUDDER STOCK)

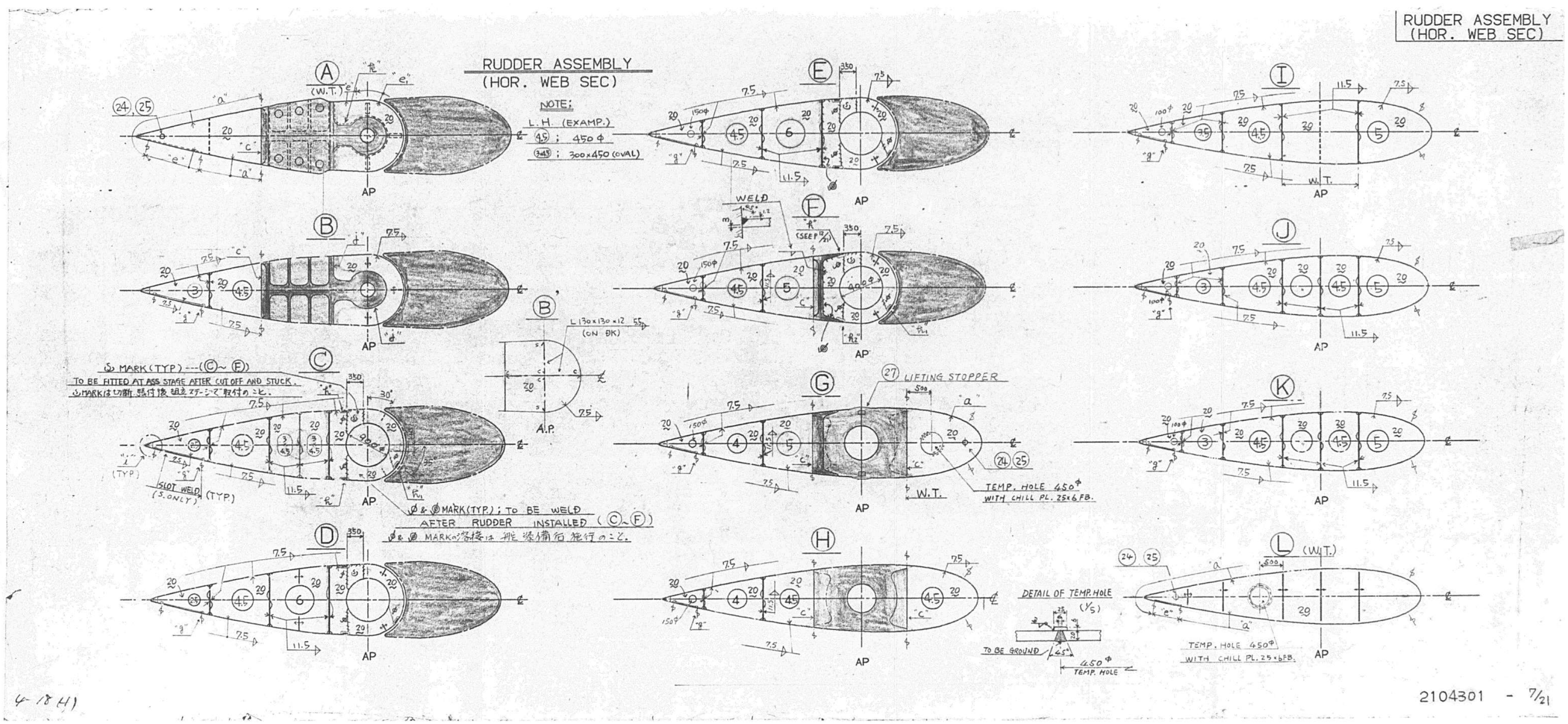


INFORMATION FOR YARD ONLY

上図において、A-A断面と B-B断面間の舵形状（OUT LINE）を次の様に決める。 先ずA-A断面に於て A.P.で舵の半厚を760mm（B-B断面と同厚）とし、A.P.より船首側に ABT. 1650mm の舵外殻の点（Q）とを直線にて結ぶ。この直線を船尾側に延長し、もう一方の舵外殻との交点を（S）とする。 B-B断面のA.P.での舵の半厚の点を（O）とし、鉛直平面（O,Q,S）により、元の舵外殻を切り取った形状をA-A、B-B間の舵形状とする。（ハッチング部：A.P.では半厚760mm一定） 次に前記により得られた稜線（図の仮想線）は ABT 3000R をつけて消し、舵外面を滑らかにする。

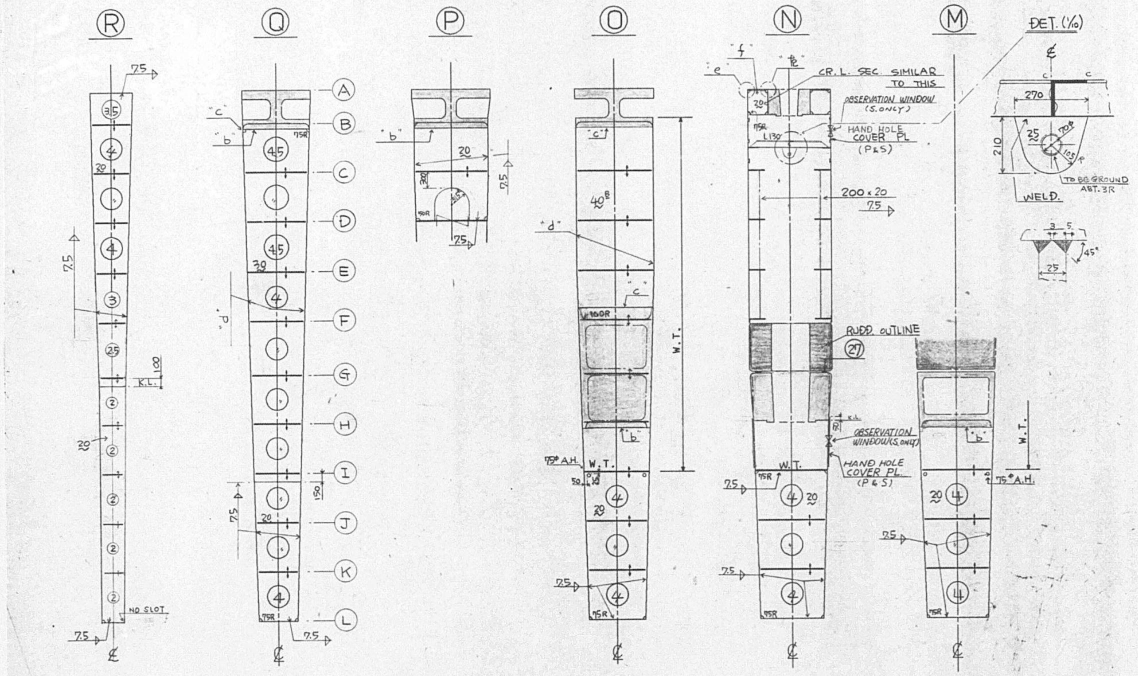
RUDDER OFFSET


RUDDER ASSEMBLY (1/50)
① RUDD. PL. (CLASSED STEEL)
③ UPP. RUDD FRAME
㉔㉕ FILL. & DRAIN FLG & PLG
OBSERVATION WINDOW (S. SIDE ONLY)
HAND HOLE & COVER PL.
S. ONLY
HAND HOLE & HINGED COVER PL FOR IN-WATER SURVEY (P&S)
㉗ LIFTING STOPPER
SHAFT CR.L.
④ LOW. RUDD. FRAME
HAND HOLE 1200×790 R=100 COVER PL. 1300×890 R=150 (P & S)
OBSERVATION WINDOW (S. SIDE ONLY)
SEAM (S. ONLY)
B.L.
AP
2104301 - 6/21
RUDDER ASSEMBLY


RUDDER ASSEMBLY
(HOR. WEB SEC)
RUDDER ASSEMBLY
(HOR. WEB SEC)
NOTE;
L.H (EXAMP.)
45 ; 450φ
345 ; 300×450 (OVAL)
MARK (TYP) --- (C ~ F)
TO BE FITTED AT ASS STAGE AFTER CUT OFF AND STUCK.
φ & φ MARK (TYP.) ; TO BE WELD
AFTER RUDDER INSTALLED (C ~ F)
SLOT WELD
(TYP)
LIFTING STOPPER
TEMP. HOLE 450φ
WITH CHILL PL. 25×6 F.B.
DETAIL OF TEMP. HOLE
TO BE GROUND
W.T.
WELD
AP
2104301 - 7/21

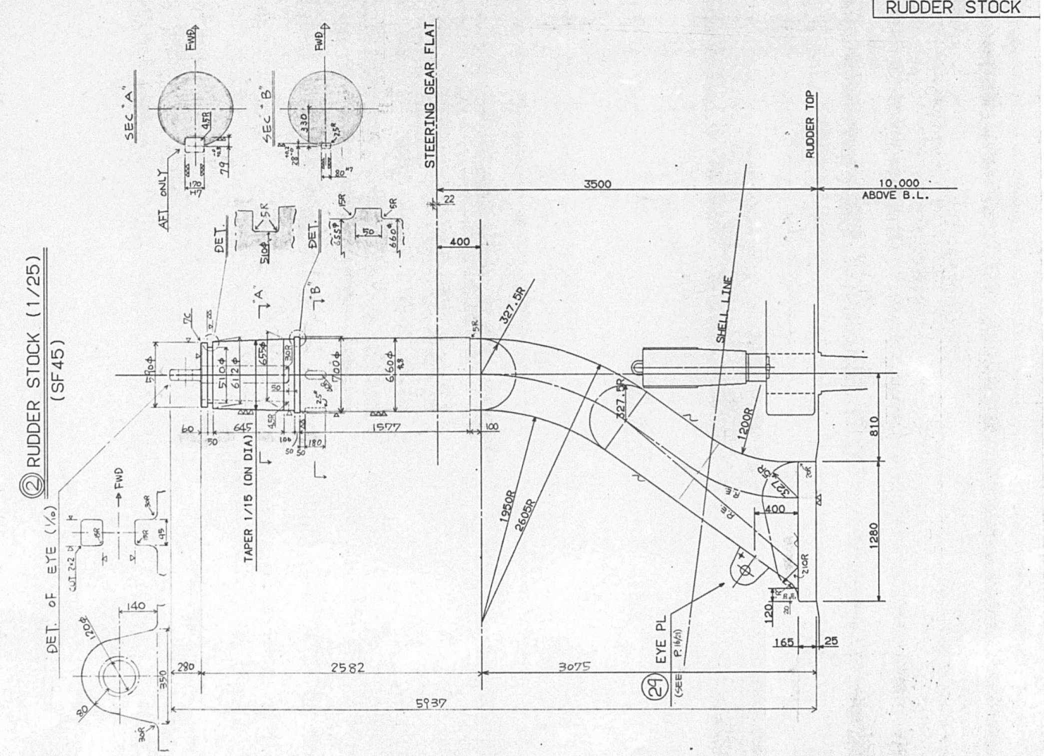
963

RUDDER ASSEMBLY (VERT. WEB SEC)

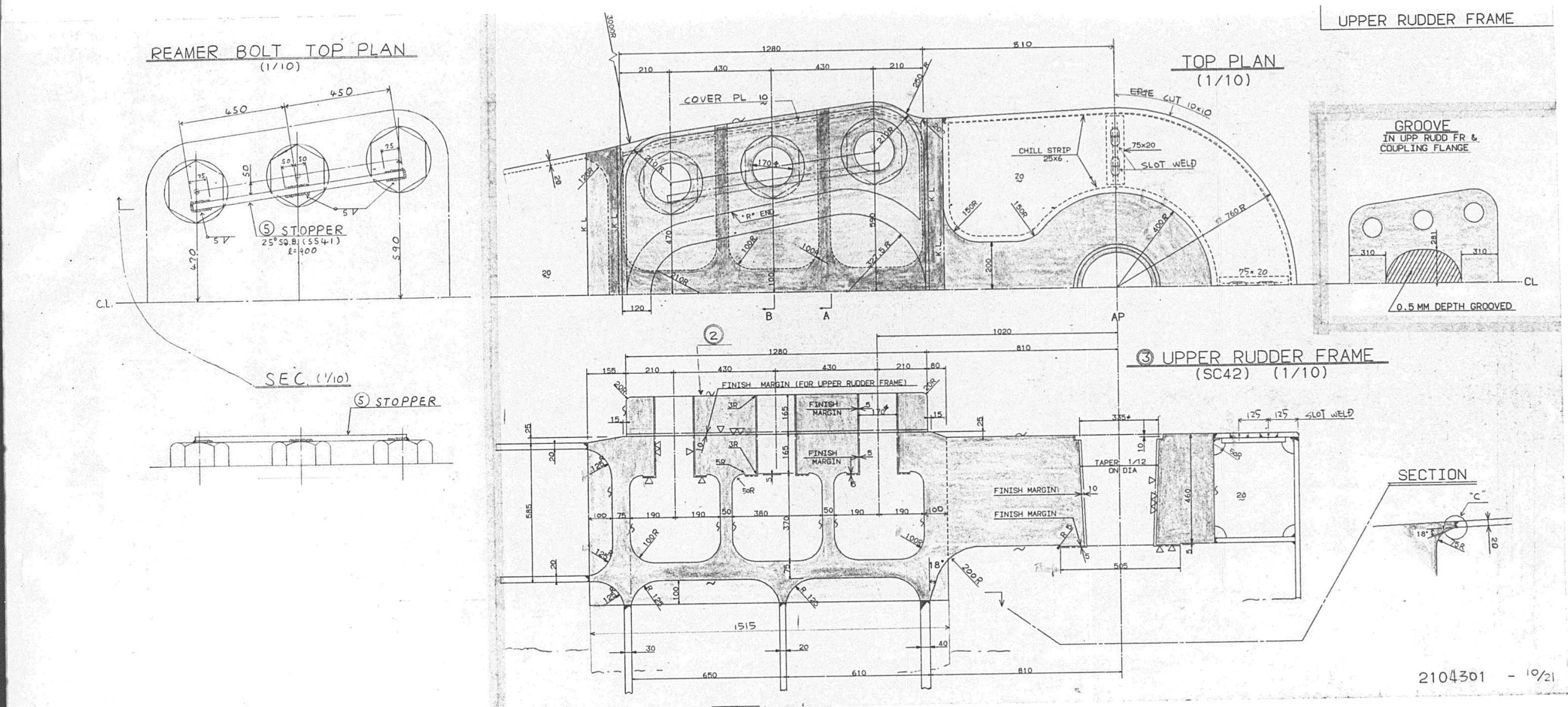


2104301 - 8/21

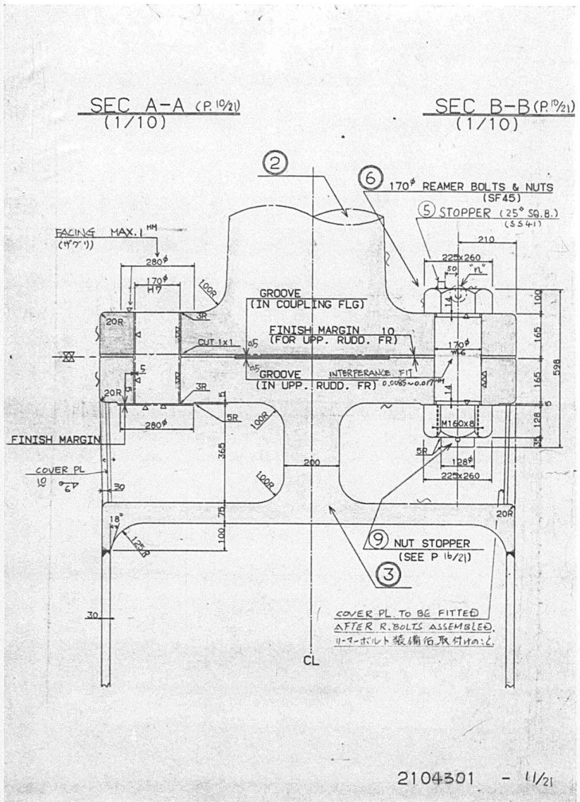
RUDDER STOCK

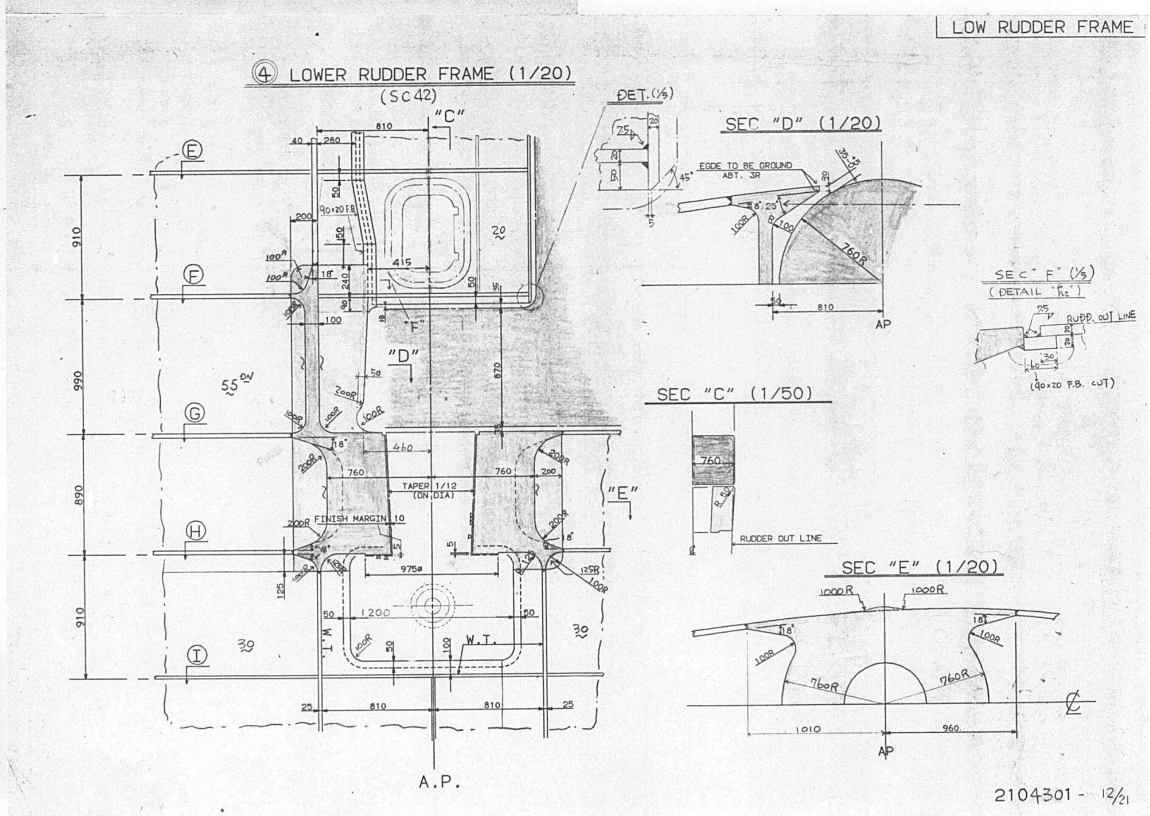


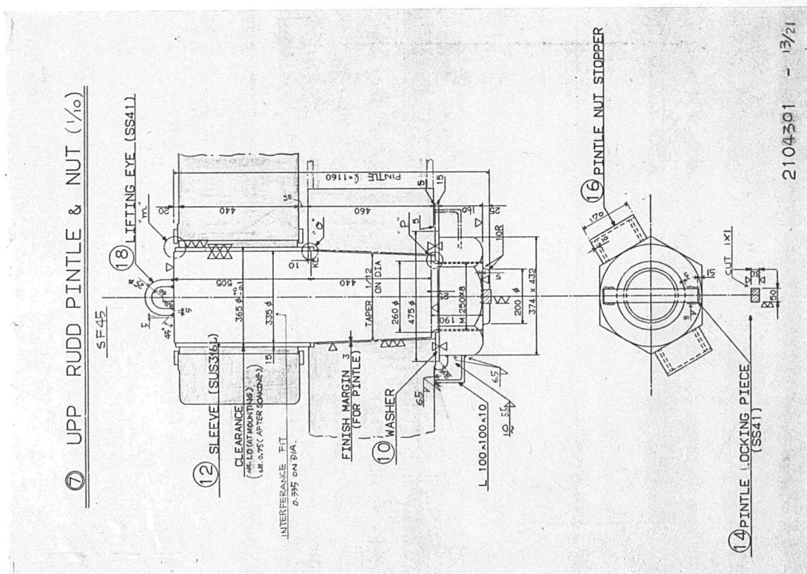
2104301 - 9/21

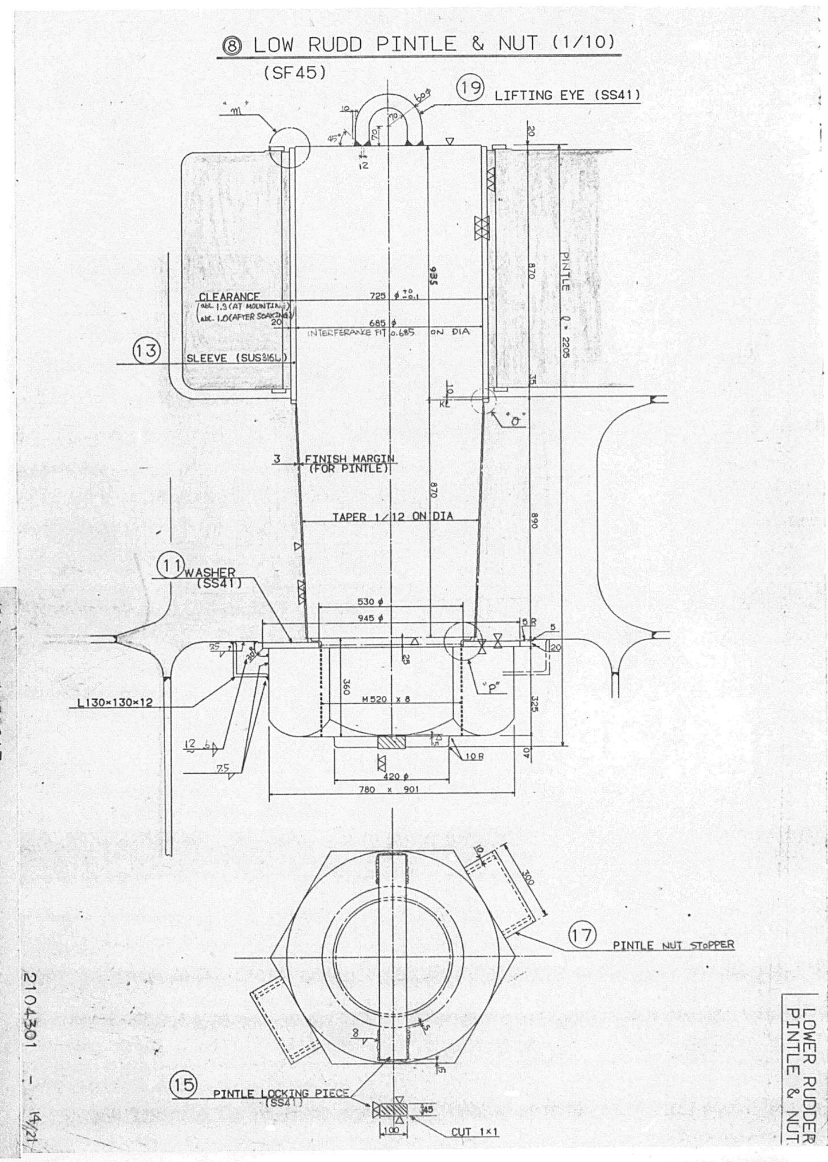

UPPER RUDDER FRAME
REAMER BOLT TOP PLAN
(1/10)
5 STOPPER
SEC. (1/10)
TOP PLAN
(1/10)
COVER PL
CHILL STRIP
SLOT WELD
GROOVE
IN UPP RUDD FR & COUPLING FLANGE
0.5 MM DEPTH GROOVED
CL
3 UPPER RUDDER FRAME
(SC42) (1/10)
FINISH MARGIN (FOR UPPER RUDDER FRAME)
FINISH MARGIN
TAPER 1/12 ON DIA
SECTION
2104301 - 10/21

965

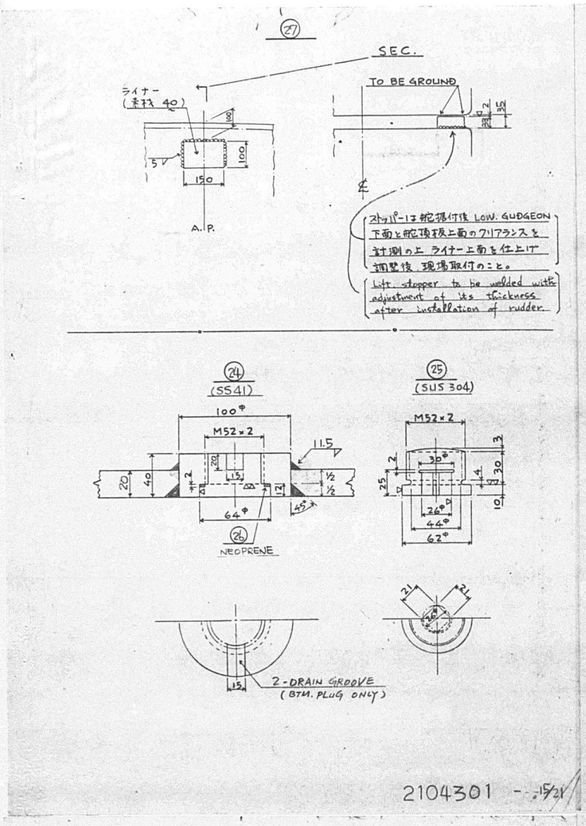

SEC A-A (P. 10/21)
(1/10)
SEC B-B (P. 10/21)
(1/10)
170ϕ REAMER BOLTS & NUTS
(SF45)
STOPPER (25° SQ.B.)
FACING MAX. 1 MM
GROOVE
(IN COUPLING FLG)
FINISH MARGIN 10
(FOR UPP. RUDD. FR)
GROOVE
(IN UPP. RUDD. FR)
INTERFERANCE FIT
FINISH MARGIN
COVER PL
NUT STOPPER
(SEE P 16/21)
COVER PL. TO BE FITTED
AFTER R. BOLTS ASSEMBLED.
リーマーボルト装備后取付けのこと
CL
2104301 - 11/21

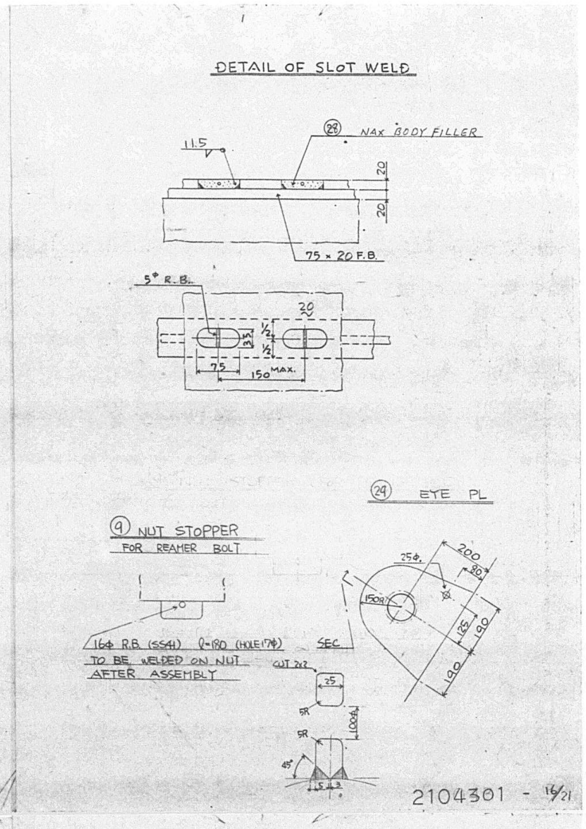

LOW RUDDER FRAME
LOWER RUDDER FRAME (1/20)
(SC42)
DET. (1/5)
SEC "D" (1/20)
EGDE TO BE GROUND
ABT. 3R
SEC "F" (1/5)
(DETAIL "F")
RUDD. OUT LINE
(90×20 F.B. CUT)
SEC "C" (1/50)
RUDDER OUT LINE
SEC "E" (1/20)
TAPER 1/12
(ON DIA)
FINISH MARGIN 10
W.T.
A.P.
AP
2104301 - 12/21

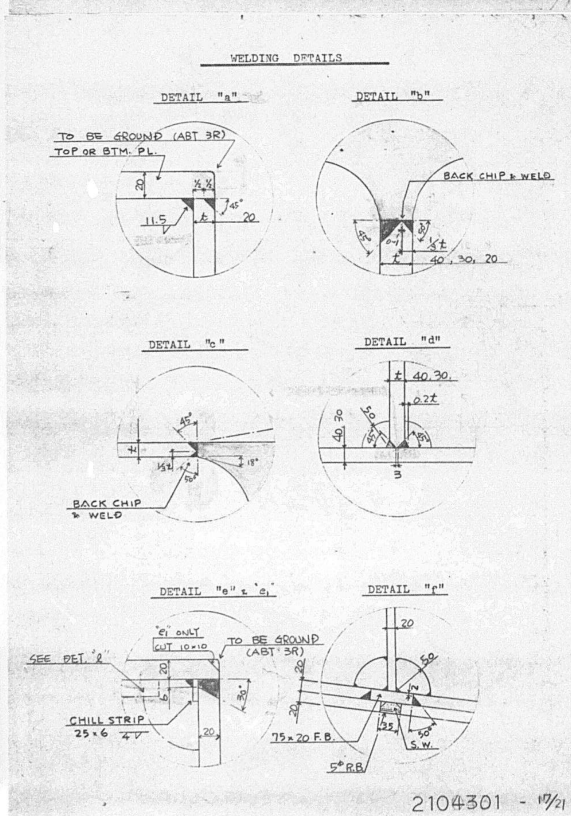

⑦ UPP RUDD PINTLE & NUT (1/10)
SF45
18 LIFTING EYE (SS41)
12 SLEEVE (SUS316L)
CLEARANCE
INTERFERANCE FIT
TAPER 1/12 ON DIA
FINISH MARGIN 3 (FOR PINTLE)
10 WASHER
L 100×100×10
16 PINTLE NUT STOPPER
14 PINTLE LOCKING PIECE (SS41)
CUT 1×1
2104301 - 13/21

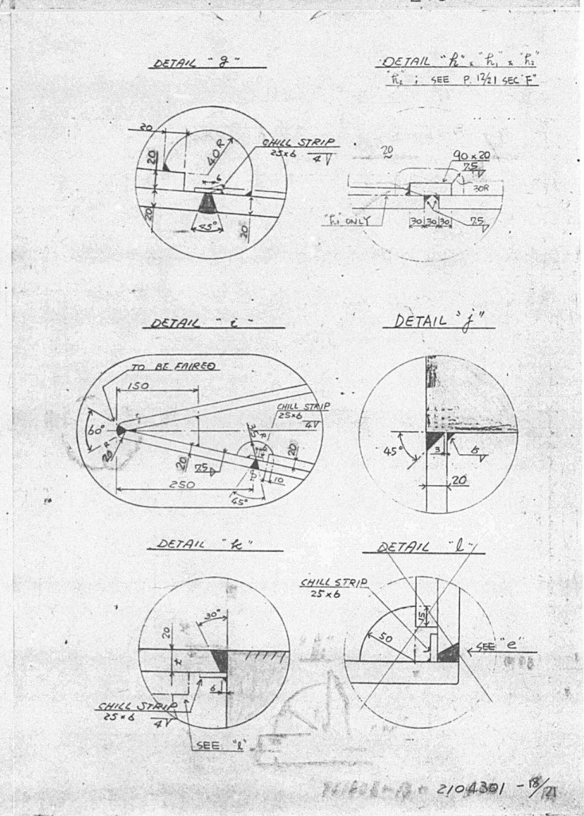

⑧ LOW RUDD PINTLE & NUT (1/10)
(SF45)
19 LIFTING EYE (SS41)
CLEARANCE
INTERFERANCE FIT 0.685 ON DIA
13 SLEEVE (SUS316L)
3 FINISH MARGIN (FOR PINTLE)
TAPER 1/12 ON DIA
11 WASHER (SS41)
L130×130×12
M520 x 8
17 PINTLE NUT STOPPER
15 PINTLE LOCKING PIECE (SS41)
CUT 1×1
LOWER RUDDER PINTLE & NUT
2104301 - 14/21

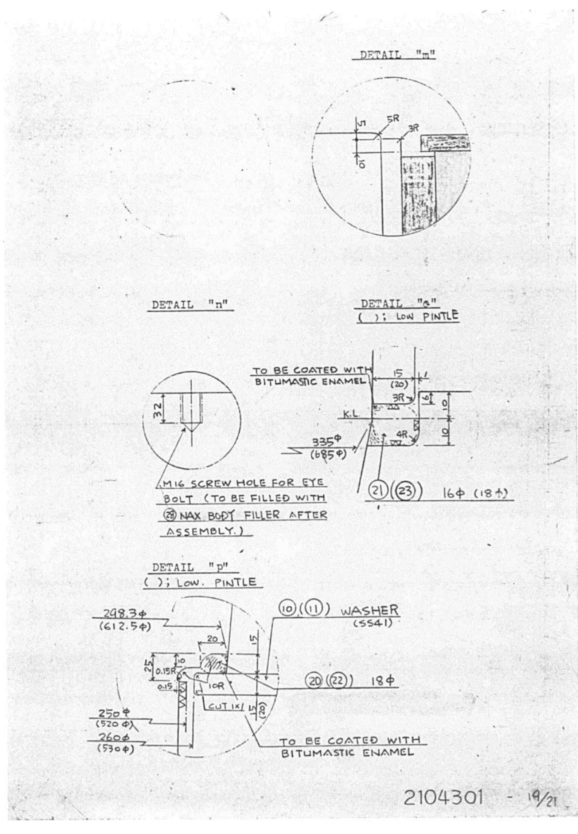
967

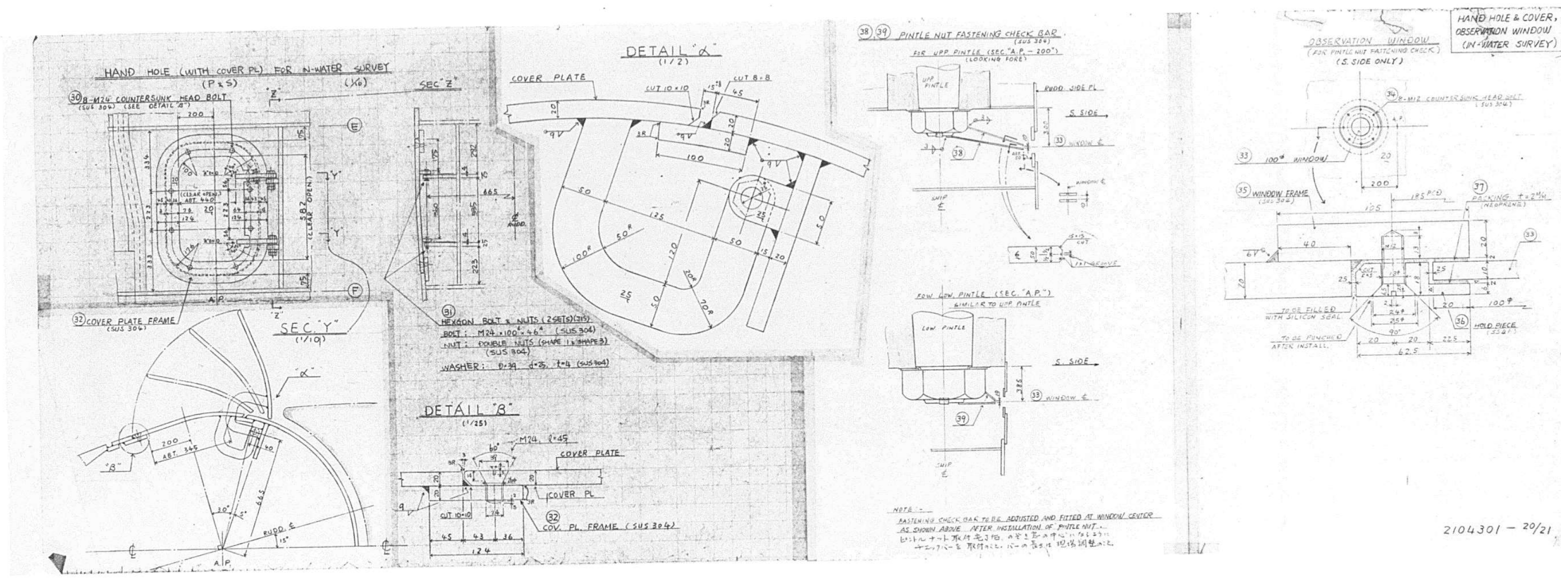

27
SEC.
ライナー
(素材 40)
TO BE GROUND
A.P.
ストッパーは舵据付後 LOW. GUDGEON 下面と舵頂板上面のクリアランスを計測の上 ライナー上面を仕上げ 調整後 現場取付のこと。
Lift stopper to be welded with adjustment of its thickness after installation of rudder.
24 (SS41)
100φ
M52×2
64φ
26 NEOPRENE
25 (SUS 304)
M52×2
62φ
2-DRAIN GROOVE (BTM. PLUG ONLY)
2104301 - 15/21

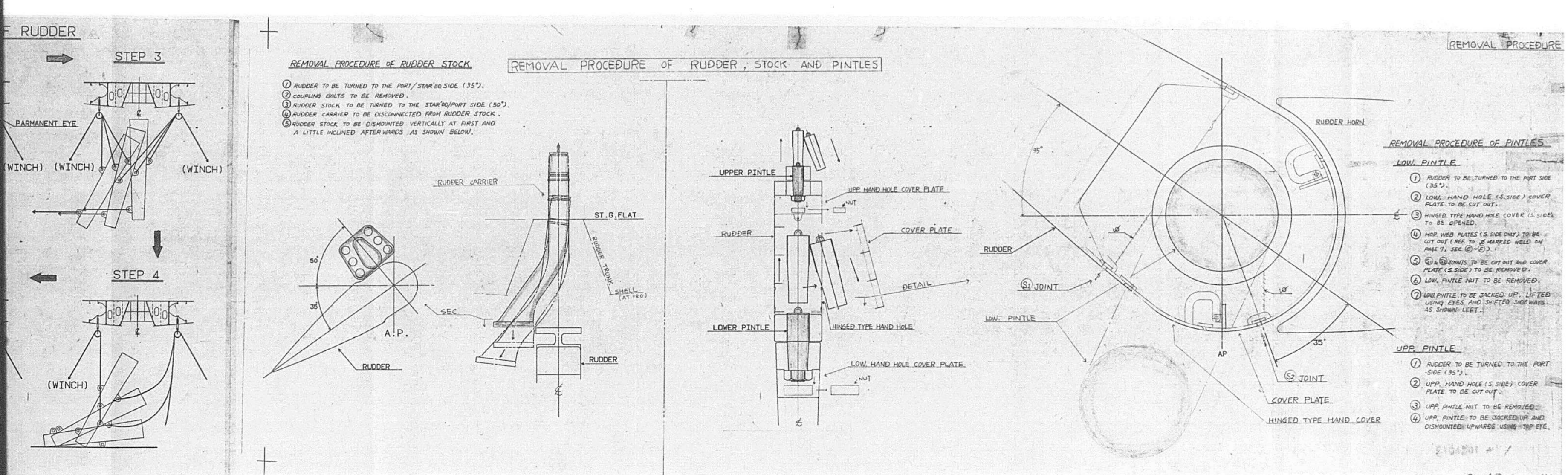

DETAIL OF SLOT WELD
28 MAX BODY FILLER
75 × 20 F.B.
5φ R.B.
150 MAX.
24 EYE PL
9 NUT STOPPER
FOR REAMER BOLT
16φ R.B. (SS41) ℓ=180 (HOLE 17φ)
TO BE WELDED ON NUT
AFTER ASSEMBLY
SEC
CUT 2×2
2104301 - 16/21


WELDING DETAILS
DETAIL "a"
TO BE GROUND (ABT 3R)
TOP OR BTM. PL.
DETAIL "b"
BACK CHIP & WELD
40, 30, 20
DETAIL "c"
BACK CHIP & WELD
DETAIL "d"
40, 30,
DETAIL "e" & "e1"
"e1" ONLY
CUT 10×10
TO BE GROUND (ABT 3R)
SEE DET. "ℓ"
CHILL STRIP 25 × 6
DETAIL "f"
75 × 20 F.B.
5φ R.B
S.W.
2104301 - 17/21


DETAIL "g"
CHILL STRIP 25×6
DETAIL "h", "h1" & "h2"
"h1" ; SEE P. 12/21 SEC "F"
90 × 20
"h1" ONLY
DETAIL "i"
TO BE FAIRED
CHILL STRIP 25×6
DETAIL "j"
DETAIL "k"
CHILL STRIP 25×6
SEE "ℓ"
DETAIL "ℓ"
CHILL STRIP 25×6
SEE "e"
2104301 - 18/21


DETAIL "m"
5R
3R
DETAIL "n"
32
M16 SCREW HOLE FOR EYE BOLT (TO BE FILLED WITH (28) NAX BODY FILLER AFTER ASSEMBLY.)
DETAIL "o"
( ); LOW PINTLE
TO BE COATED WITH BITUMASTIC ENAMEL
15
(20)
3R
K.L
4R
335φ
(685φ)
(21)((23)) 16φ (18φ)
DETAIL "p"
( ); LOW. PINTLE
298.3φ
(612.5φ)
20
0.15R
10R
CUT1K1
250φ
(520φ)
260φ
(530φ)
(10)((11)) WASHER
(SS41)
(20)((22)) 18φ
TO BE COATED WITH BITUMASTIC ENAMEL
2104301 - 19/21

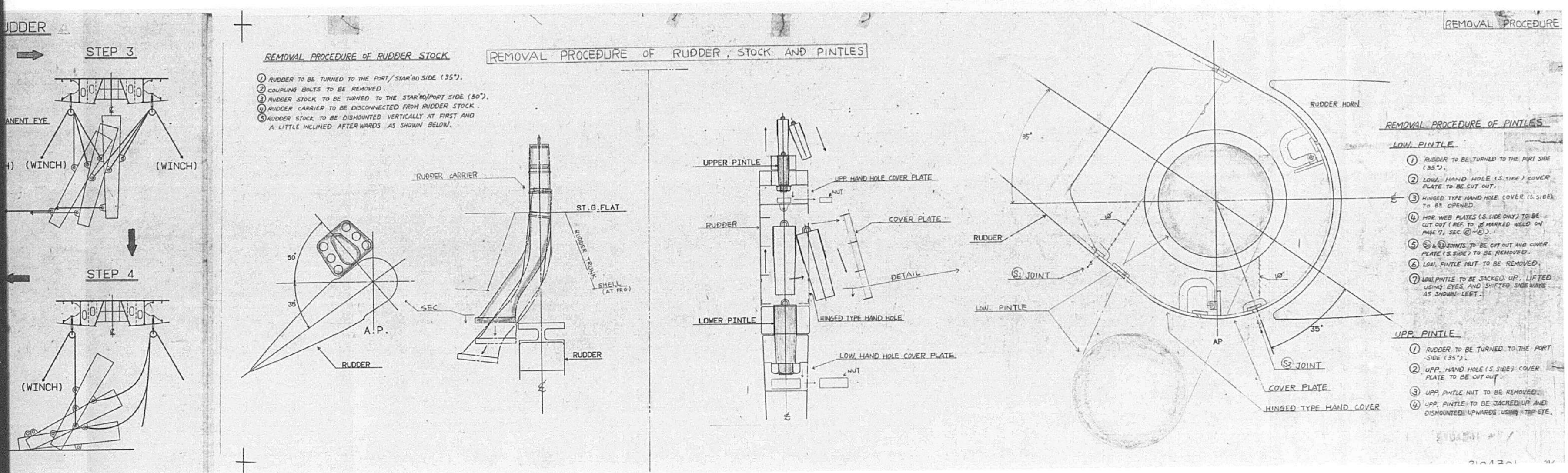

HAND HOLE (WITH COVER PL) FOR IN-WATER SURVEY
(P & S)
(1/6)
SEC "Z"
30 8-M24 COUNTERSUNK HEAD BOLT
(SUS 304) (SEE DETAIL "B")
32 COVER PLATE FRAME
(SUS 304)
SEC "Y"
(1/10)
DETAIL "α"
(1/2)
COVER PLATE
CUT 10×10
CUT 8×8
31 HEXGON BOLT & NUTS (2SETS)(JIS)
BOLT : M24 × 100ℓ × 46ℓ (SUS 304)
NUT : DOUBLE NUTS (SHAPE 1 & SHAPE 3)
(SUS 304)
WASHER : D=39 d=25 t=4 (SUS 304)
DETAIL "B"
(1/25)
M24 ℓ=45
COVER PLATE
COVER PL
32 COV. PL. FRAME (SUS 304)
38 39 PINTLE NUT FASTENING CHECK BAR
(SUS 304)
FOR UPP. PINTLE (SEC. "A.P. − 200")
(LOOKING FORE)
UPP PINTLE
RUDD. SIDE PL
S. SIDE
33 WINDOW ℄
SHIP ℄
FOR LOW. PINTLE (SEC. "A.P.")
SIMILAR TO UPP. PINTLE
LOW PINTLE
S. SIDE
33 WINDOW ℄
SHIP ℄
NOTE :-
FASTENING CHECK BAR TO BE ADJUSTED AND FITTED AT WINDOW CENTER
AS SHOWN ABOVE AFTER INSTALLATION OF PINTLE NUT.
OBSERVATION WINDOW
(FOR PINTLE NUT FASTENING CHECK)
(S. SIDE ONLY)
34 8-M12 COUNTERSUNK HEAD BOLT
(SUS 304)
33 100φ WINDOW
35 WINDOW FRAME
37 PACKING t=2M/M
(NEOPRENE)
TO BE FILLED WITH SILICON SEAL
TO BE PUNCHED AFTER INSTALL.
36 HOLD PIECE
HAND HOLE & COVER,
OBSERVATION WINDOW
(IN-WATER SURVEY)
2104301 − 20/21


RUDDER
STEP 3
PARMANENT EYE
(WINCH)
STEP 4
REMOVAL PROCEDURE OF RUDDER STOCK
REMOVAL PROCEDURE OF RUDDER, STOCK AND PINTLES
RUDDER CARRIER
ST.G.FLAT
SEC
A.P.
RUDDER
UPPER PINTLE
UPP. HAND HOLE COVER PLATE
COVER PLATE
DETAIL
LOWER PINTLE
HINGED TYPE HAND HOLE
LOW. HAND HOLE COVER PLATE
NUT
RUDDER HORN
S1 JOINT
LOW. PINTLE
S2 JOINT
COVER PLATE
HINGED TYPE HAND COVER
REMOVAL PROCEDURE
REMOVAL PROCEDURE OF PINTLES
LOW. PINTLE
UPP. PINTLE

970

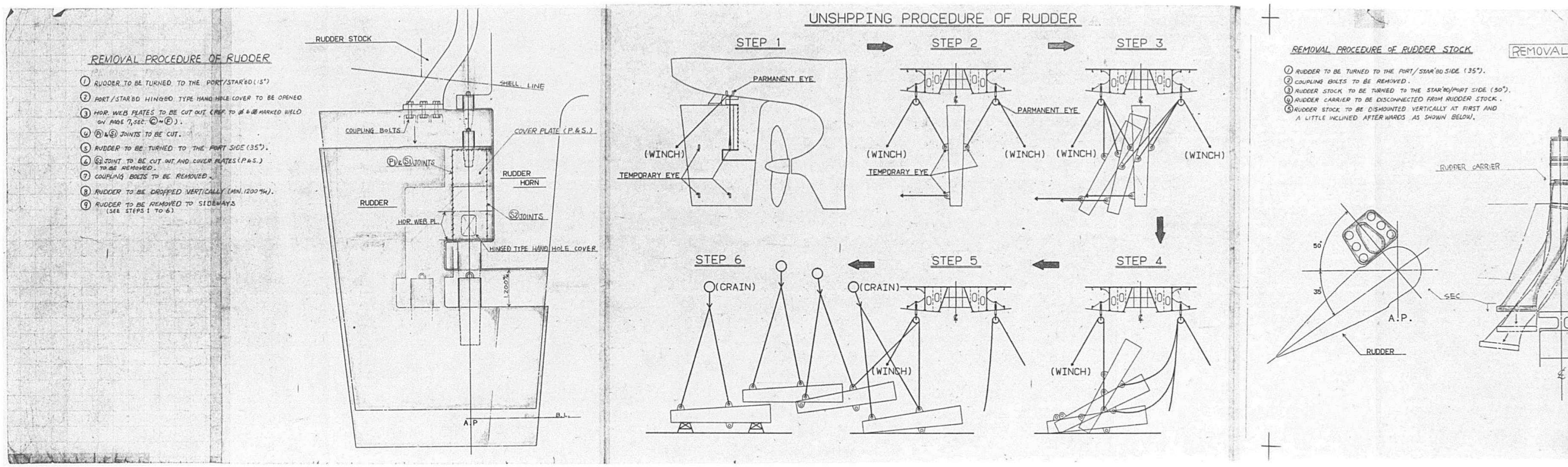
ATTENTION!

FILM NO. 970 (THE LATTER IS RIGHT)



UDDER
STEP 3
ANENT EYE
(WINCH)
(WINCH)
STEP 4
(WINCH)
REMOVAL PROCEDURE OF RUDDER, STOCK AND PINTLES
REMOVAL PROCEDURE OF RUDDER STOCK
① RUDDER TO BE TURNED TO THE PORT/STAR'BD SIDE (35°).
② COUPLING BOLTS TO BE REMOVED.
③ RUDDER STOCK TO BE TURNED TO THE STAR'BD/PORT SIDE (50°).
④ RUDDER CARRIER TO BE DISCONNECTED FROM RUDDER STOCK.
⑤ RUDDER STOCK TO BE DISMOUNTED VERTICALLY AT FIRST AND A LITTLE INCLINED AFTERWARDS AS SHOWN BELOW.
RUDDER CARRIER
ST.G.FLAT
RUDDER TRUNK
SHELL (AT FRO)
50°
35°
A.P.
SEC
RUDDER
RUDDER
UPPER PINTLE
UPP. HAND HOLE COVER PLATE
NUT
RUDDER
COVER PLATE
DETAIL
LOWER PINTLE
HINGED TYPE HAND HOLE
LOW. HAND HOLE COVER PLATE
NUT
RUDDER HORN
RUDDER
S1 JOINT
LOW. PINTLE
35°
AP
S2 JOINT
COVER PLATE
HINGED TYPE HAND COVER
REMOVAL PROCEDURE
REMOVAL PROCEDURE OF PINTLES
LOW. PINTLE
① RUDDER TO BE TURNED TO THE PORT SIDE (35°).
② LOW. HAND HOLE (S. SIDE) COVER PLATE TO BE CUT OUT.
③ HINGED TYPE HAND HOLE COVER (S. SIDE) TO BE OPENED.
④ HOR. WEB PLATES (S. SIDE ONLY) TO BE CUT OUT (REF. TO MARKED WELD ON PAGE 7, SEC. C~E).
⑤ S1 & S2 JOINTS TO BE CUT OUT AND COVER PLATE (S. SIDE) TO BE REMOVED.
⑥ LOW. PINTLE NUT TO BE REMOVED.
⑦ LOW. PINTLE TO BE JACKED UP, LIFTED USING EYES AND SHIFTED SIDEWAYS AS SHOWN LEFT.
UPP. PINTLE
① RUDDER TO BE TURNED TO THE PORT SIDE (35°).
② UPP. HAND HOLE (S. SIDE) COVER PLATE TO BE CUT OUT.
③ UPP. PINTLE NUT TO BE REMOVED.
④ UPP. PINTLE TO BE JACKED UP AND DISMOUNTED UPWARDS USING TOP EYE.

1/2 971


REMOVAL PROCEDURE OF RUDDER
① RUDDER TO BE TURNED TO THE PORT/STAR'BD (15°)
② PORT/STAR'BD HINGED TYPE HAND HOLE COVER TO BE OPENED
③ HOR. WEB PLATES TO BE CUT OUT (REF. TO ⊘ & ⊘ MARKED WELD ON PAGE 7, SEC. Ⓒ~Ⓕ).
④ Ⓟ1 & Ⓢ1 JOINTS TO BE CUT.
⑤ RUDDER TO BE TURNED TO THE PORT SIDE (35°).
⑥ Ⓢ2 JOINT TO BE CUT OUT AND COVER PLATES (P.&S.) TO BE REMOVED.
⑦ COUPLING BOLTS TO BE REMOVED.
⑧ RUDDER TO BE DROPPED VERTICALLY (MIN. 1200 m/m).
⑨ RUDDER TO BE REMOVED TO SIDEWAYS (SEE STEPS 1 TO 6)
RUDDER STOCK
SHELL LINE
COUPLING BOLTS
COVER PLATE (P.&S.)
RUDDER
HORN
RUDDER
HOR. WEB PL.
HINGED TYPE HAND HOLE COVER
A.P
B.L.
UNSHPPING PROCEDURE OF RUDDER
STEP 1
STEP 2
STEP 3
PARMANENT EYE
(WINCH)
TEMPORARY EYE
STEP 6
STEP 5
STEP 4
(CRAIN)
REMOVAL PROCEDURE OF RUDDER STOCK
REMOVAL
① RUDDER TO BE TURNED TO THE PORT/STAR'BD SIDE (35°).
② COUPLING BOLTS TO BE REMOVED.
③ RUDDER STOCK TO BE TURNED TO THE STAR'BD/PORT SIDE (50°).
④ RUDDER CARRIER TO BE DISCONNECTED FROM RUDDER STOCK.
⑤ RUDDER STOCK TO BE DISMOUNTED VERTICALLY AT FIRST AND A LITTLE INCLINED AFTERWARDS AS SHOWN BELOW.
RUDDER CARRIER
50°
35°
SEC
A.P.
RUDDER

PLAN RECORD BY MHI

MARK	DESCRIPTION	DATE	BY
-F	PREPARED AS FINISHED PLAN FOR S.NO. 1158	MAR. 11 '87	[illegible]

CON-FERRED	SHIP DESIGNING DEPARTMENT HULL DESIGNING SECTION	CLASS ABS
	APPROVED	舵及舵頭栈 RUDDER & RUDDER STOCK
	CHECKED K. Yasui	
	DRAWN	
	SCALE	
	ORDER 01-15800 ~~01-15900~~ ~~01-16400~~	ITEM / DRAWING NO. HK-33100-F / LYKES REF. NO. 220003

MITSUBISHI HEAVY INDUSTRIES, LTD.
KOBE SHIPYARD & ENGINE WORKS

APPROVAL OF OWNER & REGULATORY BODIES

ALT. NO.	OWNER DATE	OWNER LETTER NO.	USCG DATE	USCG LETTER NO.	ABS DATE	ABS LETTER NO.	USPH DATE	USPH LETTER NO.
ORIGINAL	15 MAR. '85	OFT/MES/126			Mar. 1 '85	File Ref: T-8-2		

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SHIPYARD AND SHIP'S NO. & NAME

~~MITSUI TAMANO~~		MITSUBISHI KOBE	
NO. 1323	~~DOCTOR LYKES~~	NO. 1158	JAMES LYKES
NO. 1324	~~ALMERIA LYKES~~	NO. 1159	~~JOSEPH LYKES~~
NO. 1325	~~TILLIE LYKES~~	NO. 1164	~~SOLON TURMAN~~

MITSUI ENGINEERING & SHIPBUILDING CO., LTD.
TAMANO WORKS

SHIP. DESIGN DEPARTMENT — MANAGER: T. Oishi
STRUCTURE DESIGN SEC. — SEC. CHIEF: A. Coga
ASSIST. CHIEF / CHARGE ENG'R: M. Hayashi
STAFF: N. Fukuda
DATE (TEL 2230)

SHIP'S NO. / SHIP'S NAME

舵及舵頭栈
RUDDER & RUDDER STOCK

JOB NO.	SCALE	LYKES REF. NO.	MITSUI DRAWING NO.
TS1323/24/25	1/60, 1/25	220003	2104301
JOBCLASSIF. NO. B 04	1/10, 1/20		

(22 SHEETS WITH COVER)

PLAN RECORD

ALT. NO.	MARK	ALTERATION/DESCRIPTION	DATE & SIGNATURE
		"PREPARED FOR S.NO. 1323 AS FINISHD PLAN, MADE APPLICABLE TO S.NO. 1324 AND S.NO. 1325"	NOV. 28. '86

DWG. NO. 2104301-1

PRINCIPAL PARTICULARS

LENGTH	(P.P.)	(L_{pp})	245.00 M
		(L_{scant})	241.627 M
BREADTH	(MLD)	(B)	32.20 M
DEPTH	(MLD)	(D)	18.80 M
DRAFT	(MLD)	(d)	11.88 M
TOTAL RUDDER AREA	(WITH HORN)	(A')	65.96 M^2
TOTAL RUDDER AREA	(WITHOUT HORN)	(A)	54.16 M^2
RUDDER AREA	(FWD OF TURNING AXIS)	(A_f)	13.59 M^2
RUDDER AREA	(AFT OF TURNING AXIS)	(A_a)	40.57 M^2
RUDDER AREA RATIO		$(A'/L_{pp}\cdot d)$	1/44.13
BALANCING RATIO		(A_f/A)	0.251
ASPECT RATIO		$(\bar{h}/\ell)$	ABT. 1.426
RUDDER DESIGN SPEED (FULL LOAD AT MCR)			22.8 KT
WORKING ANGLE OF RUDDER (MAX.)			35°

NOTE:

1 ABS CERTIFICATION TO BE REQUIRED FOR ◎ ITEMS.

2 APPROVED LOW-HYDROGEN ELECTRODES TO BE USED FOR INITIAL SEVERAL BEADS OF FABRICATION AND PRODUCTION WELDS.

3 IN CASE OF WELDING OF CASTING AND HEAVY PLATING (CAST TO STEEL) WELDING JOINT TO BE SUITABLY PRE-HEATED PRIOR TO WELDING AND LOW-HYDROGEN ELECTRODES TO BE USED.

4 RUDDER TIGHTNESS TO BE TESTED BY THE COMPRESSED AIR. (PRESSURE 0.5 KG/CM^2)

5 CASTING & FORGING TO BE INSPECTED WITH MAGNAFLUX OR ULTRASONIC.

6 ALL CASTING TO BE ANNEALED BUT FABRICATED BLOCKS TO BE AS WELD.

7 FOR COATING OF INTERIOR SURFACES, SEE "PAINTING SCHEDULE" (DWG.NO 3101001)

8 GRADE OF PLATES TO BE AS FOLLOWS.

$t \leq 12.5$ --- AAM (GRADE "A" RIMMED)
$t = 20, 25, 30$ --- AAS (GRADE "A" SEMI-KILLED)
$t = 40$ B --- ABS (GRADE "B" SEMI-KILLED)
$t = 55$ DN --- ADN (GRADE "D" KILLED & NORMALIZED)

9 THIS RUDDER IS DESIGNED TO ENABLE EASE OF INWATER SURVEY.

10 MACHINING MARK & SURFACE ROUGHNESS:

UNIT (MICRON)

MACHINING MARK & SURFACE ROUGHNESS:					
MACHINING MARK		▽▽▽	▽▽	▽	~
ROUND SURFACE	DIA. (MM) 0- 20	1.6-S	12-S	35-S	
	21- 200	3.0-S	12-S	35-S	
	201- 500	3.0-S	12-S	50-S	
	501- 750	6.0-S	18-S	100-S	
	751-1000	6.0-S	25-S	200-S	
FLAT SURFACE		6.0-S	12-S	35-S	

IN CASE THAT THE SURFACE ROUGHNESS GRADE IS DIFFERENT FROM THE ABOVE, THE MACHINING MARK TO BE ACCOMPANIED BY THE SPECIFIED SUFACE ROUGHNESS.

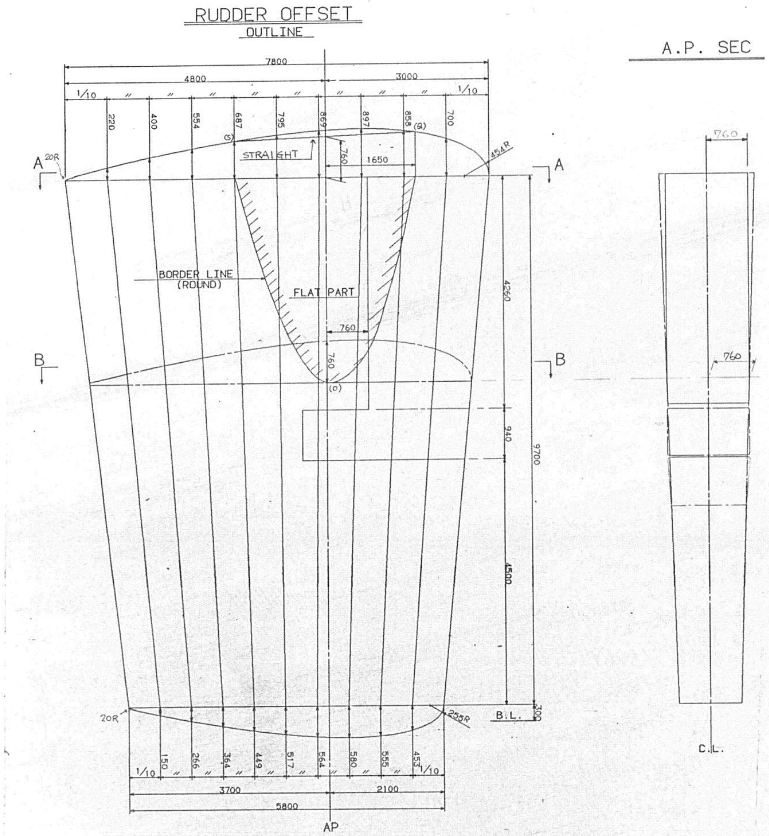
MATERIAL LIST

	ITEM	MATERIAL	NO	WT (TON) (ABT)	SHOP	ARR. NO
◎1	RUDDER ASSEMBLY (PLATE)	ABS STEEL	1			
◎2	RUDDER STOCK	(INGOT FORGED) SF45 (MAX.C=0.23%)	1			
◎3	UPPER RUDDER FRAME	SC42 (MAX.C=0.20%)	1			
◎4	LOWER RUDDER FRAME	SC42 (MAX.C=0.20%)	1			
5	STOPPER (FOR REAMER BOLTS)	SS41	2			
◎6	170φ REAMER BOLT & NUT	SF45	6			
◎7	UPP. RUDD. PINTLE & NUT	SF45	1			
◎8	LOW. RUDD. PINTLE & NUT	SF45	1			
9	(FOR REAMER BOLT) R.B. NUT STOPPER	SS41	6			
10	(FOR UPP. PINTLE) WASHER	SS41	1			
11	(FOR LOW. PINTLE) WASHER	SS41	1			
12	(FOR UPP. PINTLE) SLEEVE	(STAINLESS ST.) SUS 316L	1			
13	(FOR LOW. PINTLE) SLEEVE	(STAINLESS ST.) SUS 316L	1			
14	(FOR UPP. PINTLE) PINTLE LOCKING PIECE	SS41	1			
15	(FOR LOW. PINTLE) PINTLE LOCKING PIECE	SS41	1			
16	(FOR UPP. PINTLE) PINTLE NUT STOPPER	SS41	1			
17	(FOR LOW. PINTLE) PINTLE NUT STOPPER	SS41	1			
18	(FOR UPP. PINTLE) EYE (25φ R.B)	SS41	1			
19	(FOR LOW. PINTLE) EYE (50φ R.B)	SS41	1			
20	(FOR UPP. PINTLE) 18φ PACK. RING (NUT)	(HARDNESS 45±5) SYNTHETIC RUBBER	1			
21	(FOR UPP. PINTLE) 16φ PACK. RING (SLEEVE)	(HARDNESS 45±5) SYNTHETIC RUBBER	1			
22	(FOR LOW. PINTLE) 18φ PACK. RING (NUT)	(HARDNESS 45±5) SYNTHETIC RUBBER	1			
23	(FOR LOW. PINTLE) 18φ PACK. RING (SLEEVE)	(HARDNESS 45±5) SYNTHETIC RUBBER	1			
24	FILLING & DRAIN FLANGE	SS41	3			
25	FILLING & DRAIN PLUG	(STAINLESS ST.) SUS304	3			
26	PACKING (FOR PLUG)	SYNTHETIC RUBBER (NEOPRENE SHORE HARDNESS 60)	3			
27	LIFTING STOPPER	(STAINLESS ST.) SUS 304	2			
28	(FOR SLOT WELD) NAX BODY FILLER	POLYESTER RESIN	1			
29	(FOR RUDDER STOCK) EYE PLATE	SS41	1			
30	(FOR HANHOLE & COVER PL) M24 COUNTERSUNK BOLT	SUS 304	8			
31	(FOR COVER PL) BOLTS & NUTS (M24)	SUS 304	4 SETS			

MATERIAL LIST

	ITEM	MATERIAL	NO	WT (TON) (ABT)		
32	(FOR HANDHOLE & COVER PL.) COV. PL. FRAME	SUS 304	2			
33	(FOR OBSERVATION WINDOW) 100φ WINDOW	TOUGHENED GLASS	2			
34	(FOR OBSERVATION WINDOW) M12 COUNTERSUNK HEAD BOLT	SUS 304	16			
35	(FOR OBSERVATION WINDOW) WINDOW FRAME	SUS 304	2			
36	(FOR OBSERVATION WINDOW) HOLD PIECE	SS41	2			
37	(FOR OBSERVATION WINDOW) PACKING	SYNTHETIC RUBBER (NEOPRENE)	4			
38	(FOR UPP. PINTLE) PINTLE NUT FASTENING CHECK BAR	SUS 304	1 SET			
39	(FOR LOW. PINTLE) PINTLE NUT FASTENING CHECK BAR	SUS 304	1 SET			

TOTAL WEIGHT ABT. 70.4 TON (EXCLUDING RUDDER STOCK)

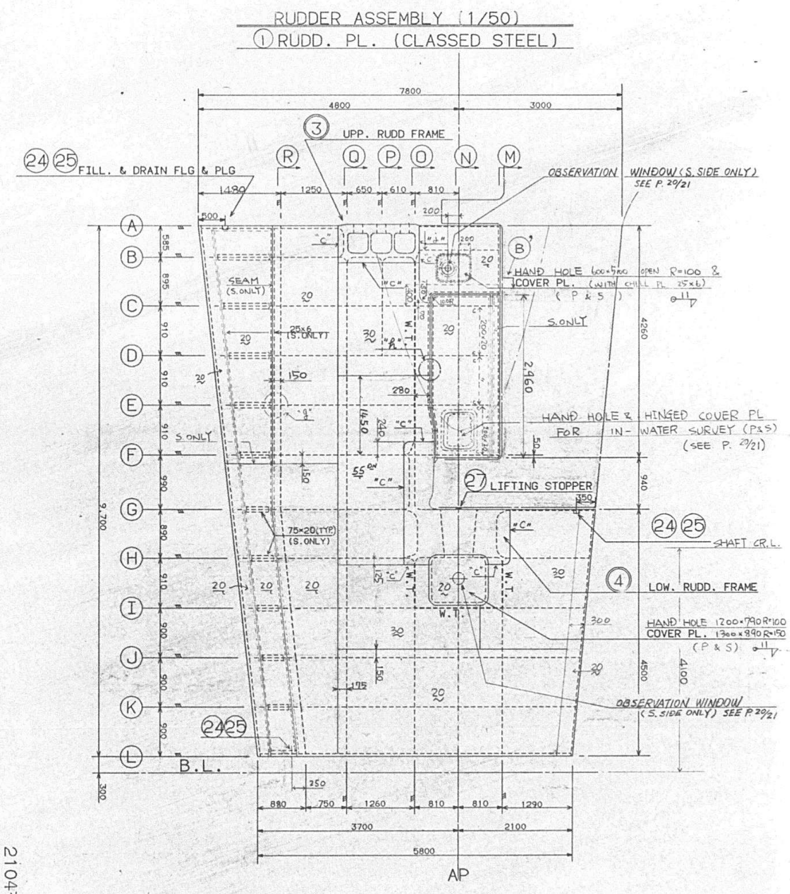


INFORMATION FOR YARD ONLY

上図において. A-A断面と B-B断面間の舵形状（OUT LINE）を次の様に決める。 先ずA-A断面に於て A.P.で舵の半厚を760mm（B-B断面と同厚）とし. A.P.より船首側に ABT. 1650mmの舵外殻の点（Q）とを直線にて結ぶ。この直線を船尾側に延長し. もう一方の舵外殻との交点を（S）とする。 B-B断面のA.P.での舵の半厚の点を（O）とし. 鉛直平面（O, Q, S）により. 元の舵外殻を切り取った形状をA-A, B-B間の舵形状とする。（ハッチング部；A.Pでは半厚 760mm 一定） 次に前記により得られた稜線（図の仮綾線）はABT 3000Rをつけて消し. 舵外面を滑らかにする。

2104301 - 5/21

RUDDER OFFSET

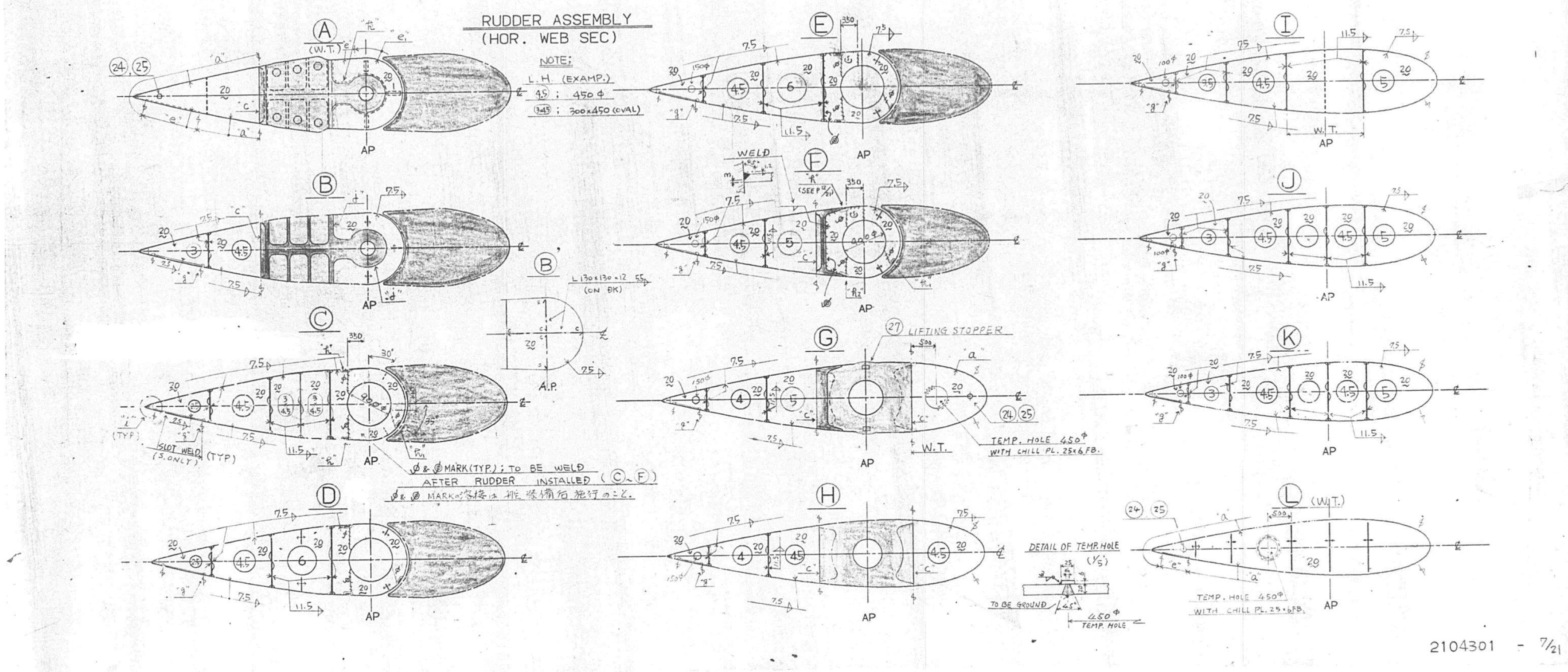


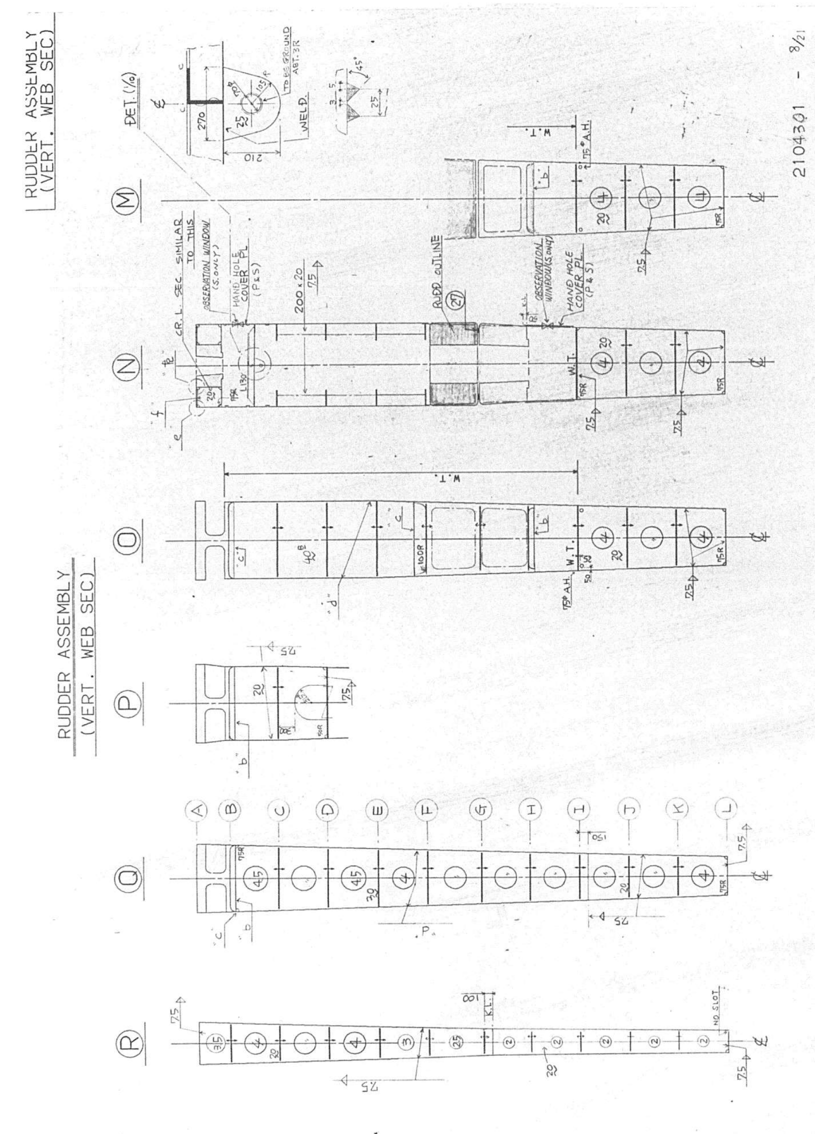
2104301 - 6/21

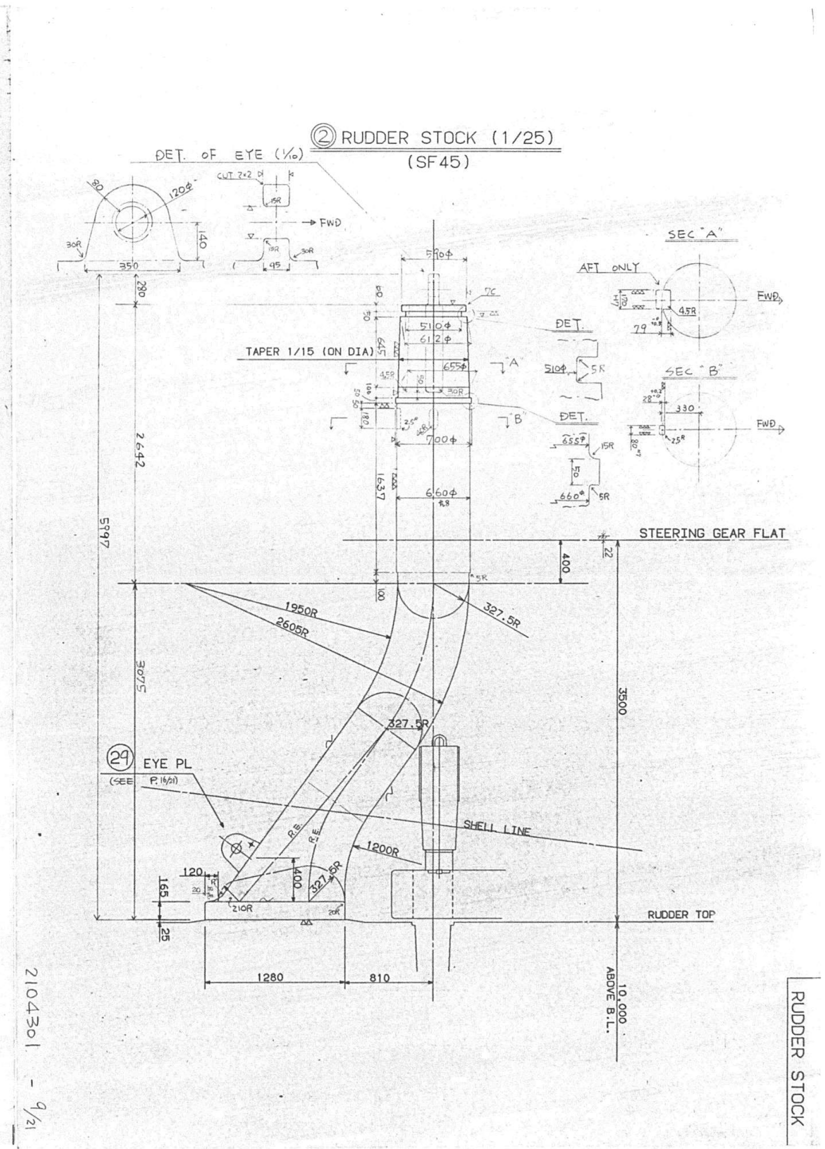
RUDDER ASSEMBLY

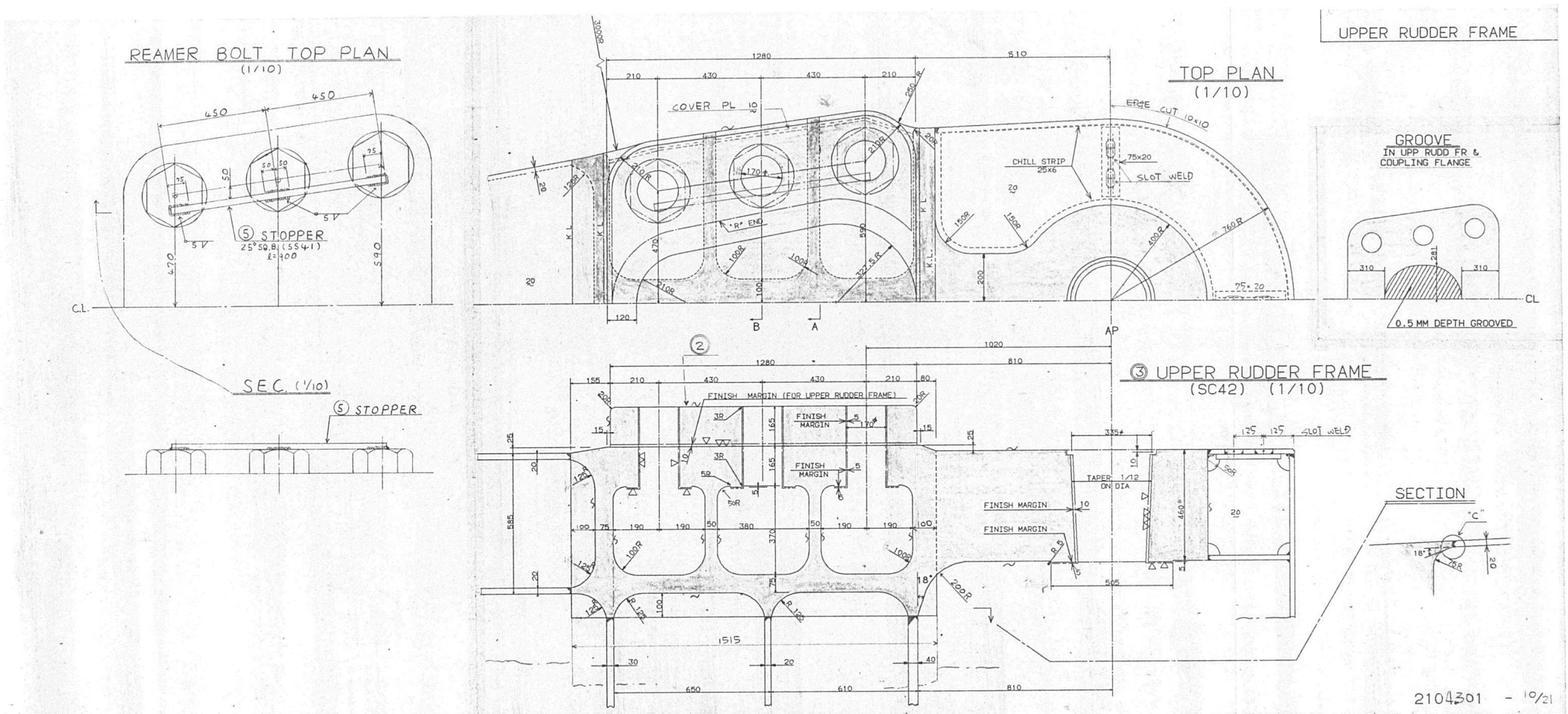
975

RUDDER ASSEMBLY
(HOR. WEB SEC)

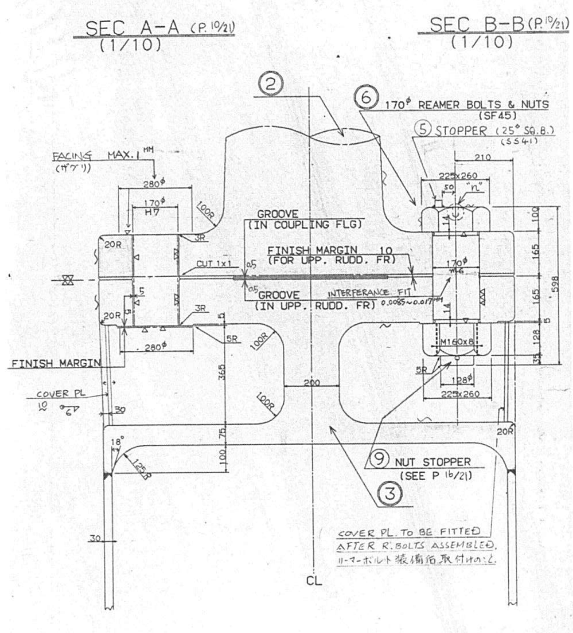



RUDDER ASSEMBLY
(VERT. WEB SEC)
DET. (1/10)
WELD.
HAND HOLE COVER PL (P & S)
OBSERVATION WINDOW
RUDD OUTLINE
W.T.
2104301 - 8/21


② RUDDER STOCK (1/25)
(SF45)
DET. OF EYE (1/10)
FWD
TAPER 1/15 (ON DIA)
SEC "A"
AFT ONLY
SEC "B"
DET.
STEERING GEAR FLAT
29 EYE PL
(SEE P.18/21)
SHELL LINE
RUDDER TOP
10,000 ABOVE B.L.
RUDDER STOCK
2104301 - 9/21

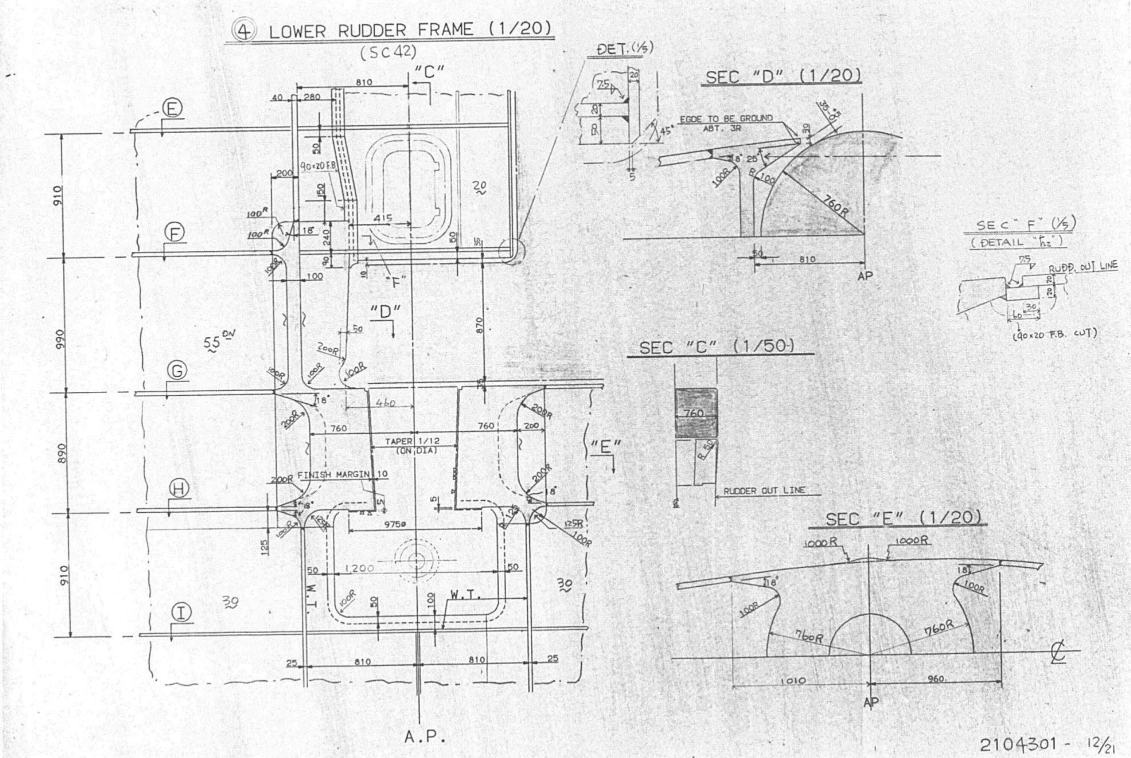

UPPER RUDDER FRAME
REAMER BOLT TOP PLAN
(1/10)
⑤ STOPPER
25°SQ.B (SS41)
ℓ=400
SEC. (1/10)
⑤ STOPPER
TOP PLAN
(1/10)
COVER PL 10
"R" END
EDGE CUT 10×10
CHILL STRIP
25×6
SLOT WELD
GROOVE
IN UPP RUDD FR &
COUPLING FLANGE
0.5 MM DEPTH GROOVED
③ UPPER RUDDER FRAME
(SC42) (1/10)
FINISH MARGIN (FOR UPPER RUDDER FRAME)
FINISH MARGIN
TAPER 1/12
ON DIA
SECTION
"C"
2104301 - 10/21

978



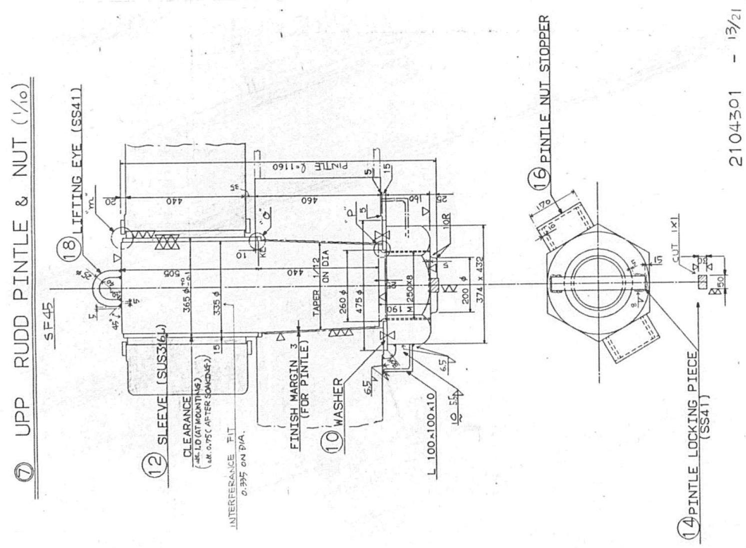
2104301 - 11/21

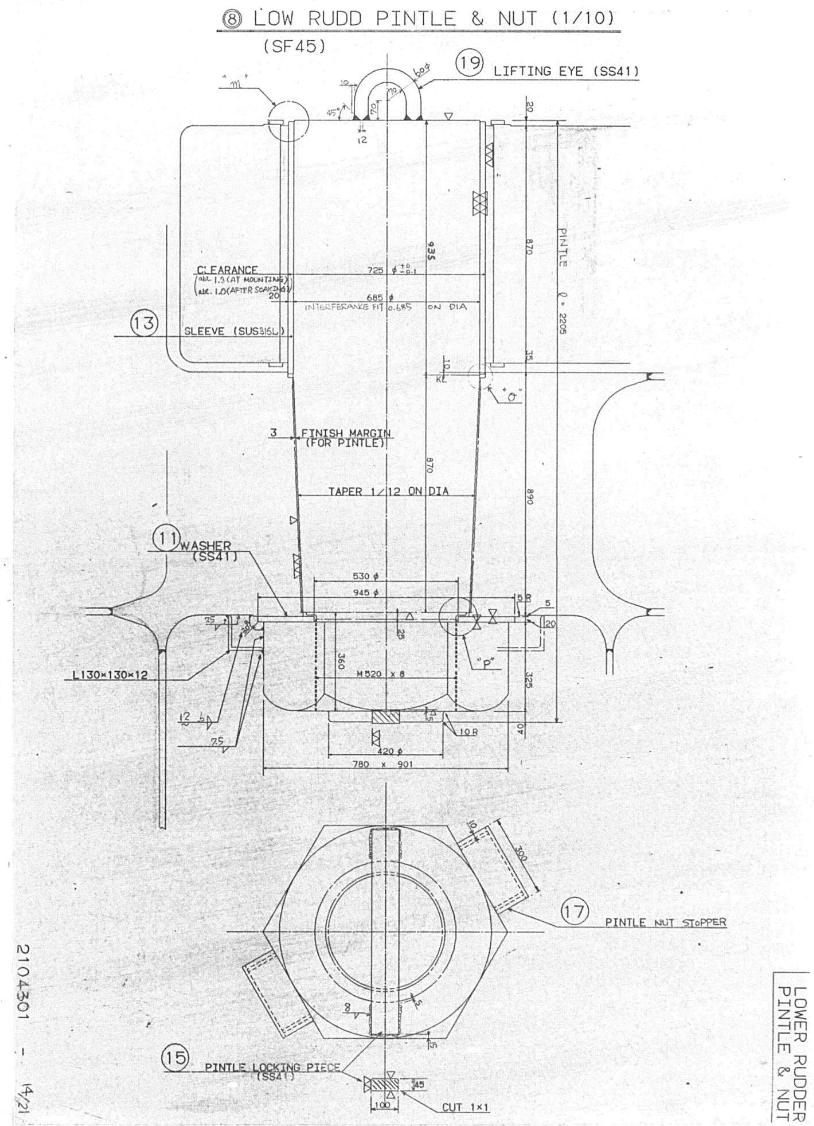
LOW RUDDER FRAME



2104301 - 12/21

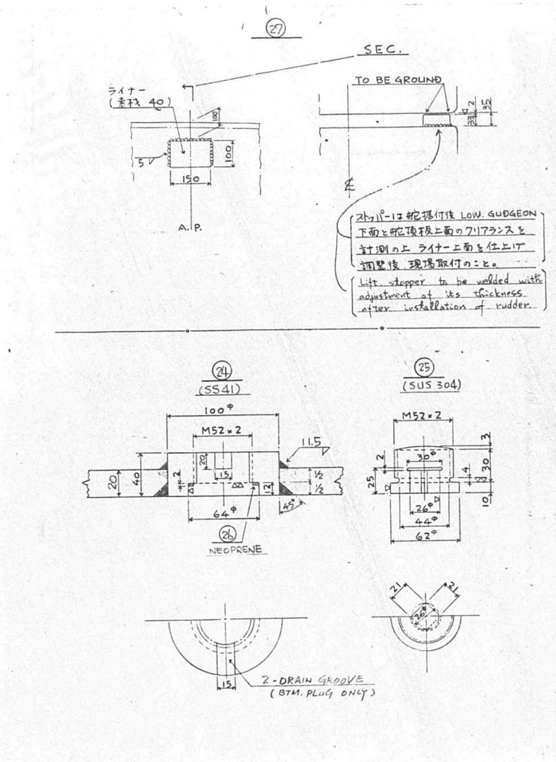
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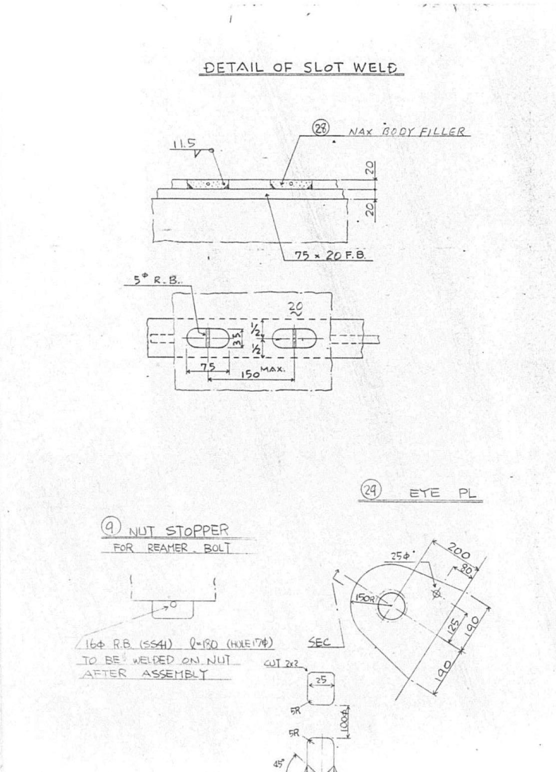


LOWER RUDDER PINTLE & NUT

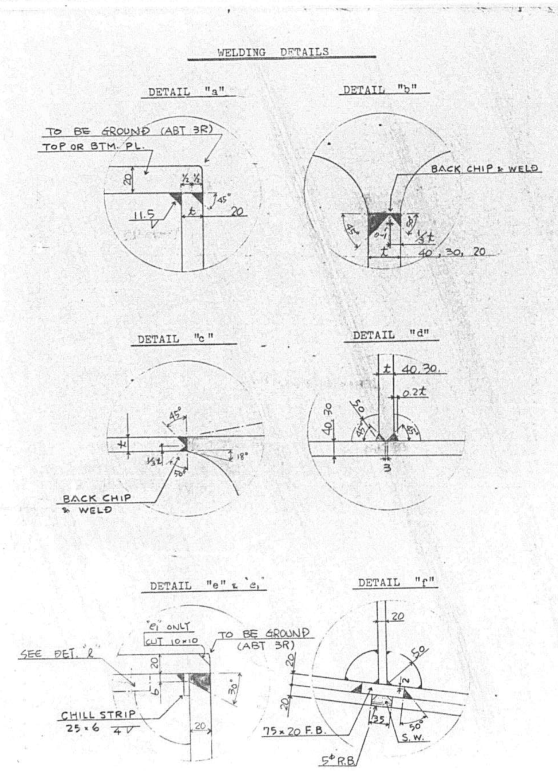
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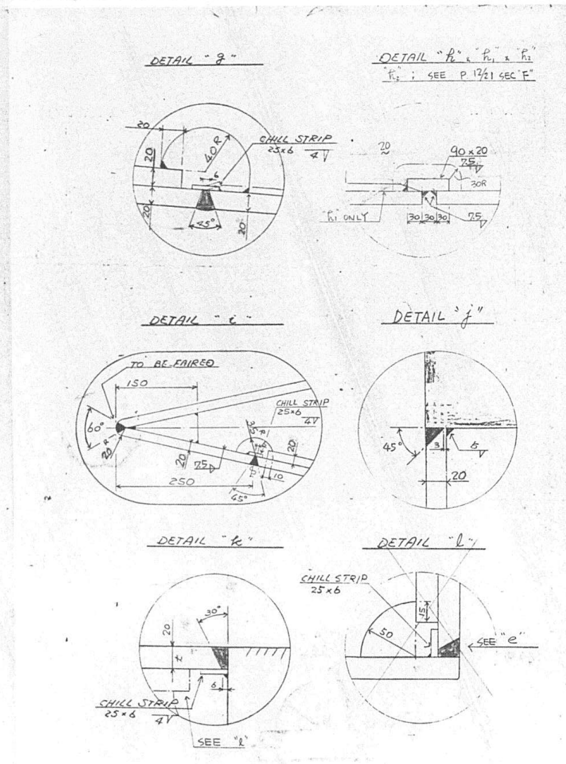
2104301 - 15/21



2104301 - 16/21

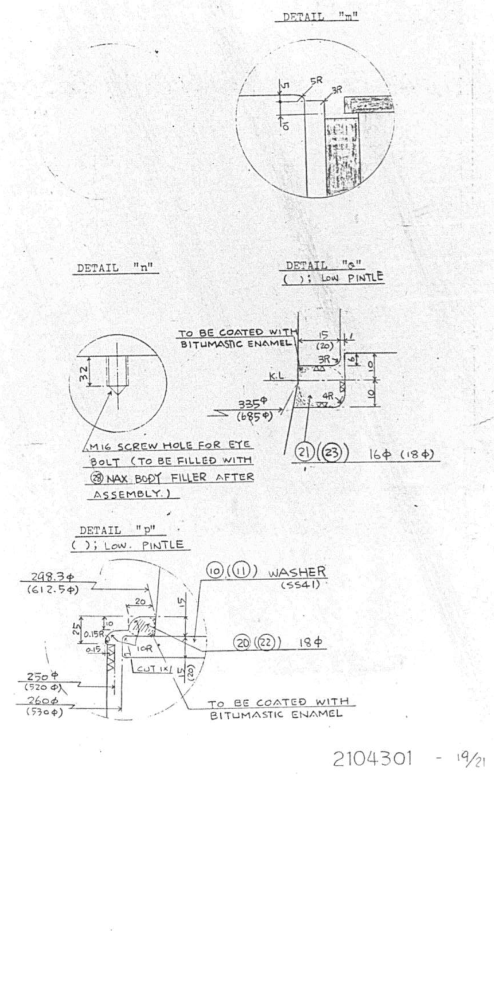


2104301 - 17/21

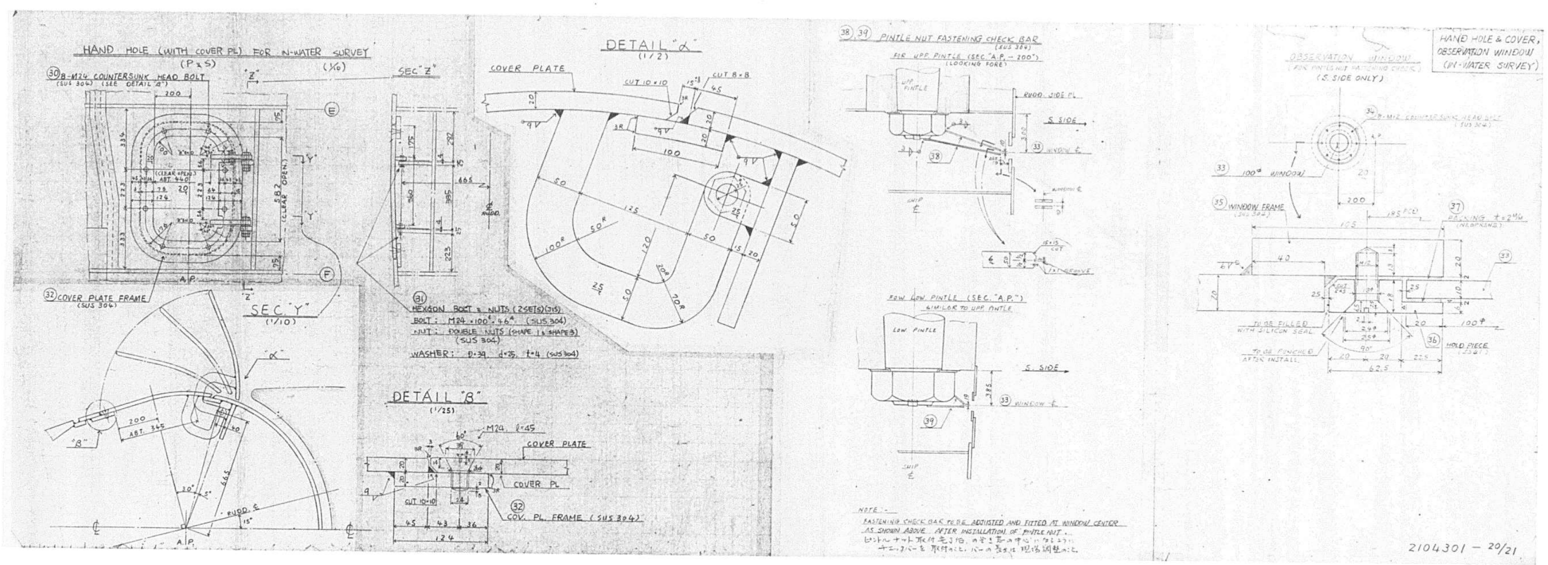


2104301 - 18/21

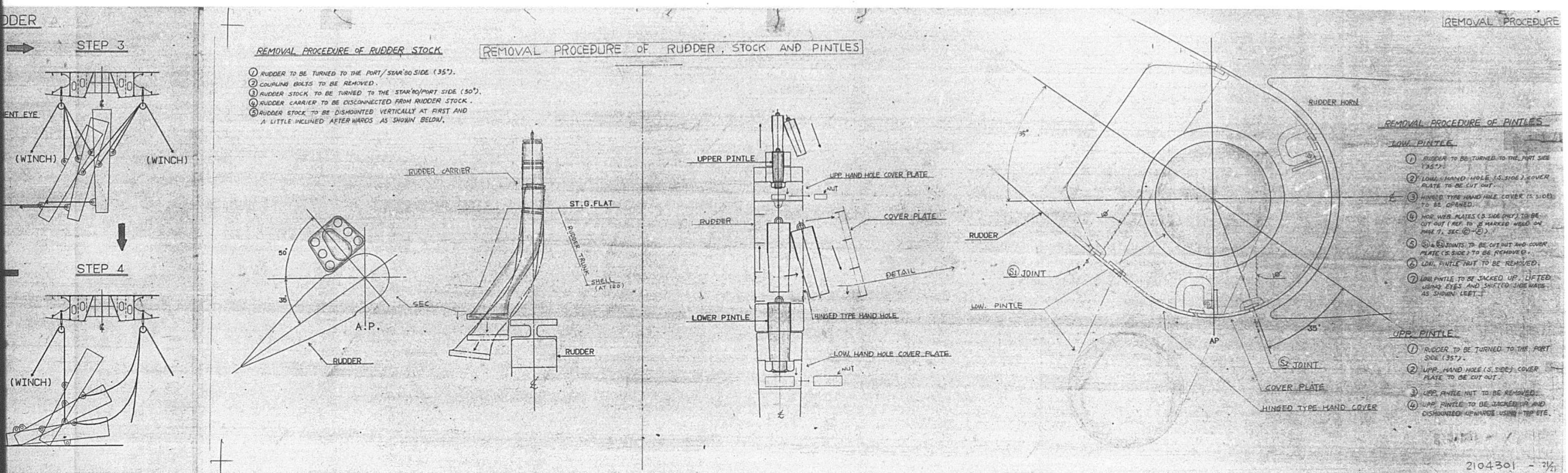
981



2104301 - 19/21



HAND HOLE (WITH COVER PL) FOR IN-WATER SURVEY
SEC "Z"
SEC "Y"
DETAIL "α"
DETAIL "B"
COVER PLATE
PINTLE NUT FASTENING CHECK BAR
FOR UPP. PINTLE (SEC "A.P. - 200")
FOR LOW. PINTLE (SEC. "A.P.")
SIMILAR TO UPP. PINTLE
S. SIDE
OBSERVATION WINDOW
(S. SIDE ONLY)
WINDOW FRAME
HOLD PIECE
HAND HOLE & COVER, OBSERVATION WINDOW (IN-WATER SURVEY)
NOTE :-
FASTENING CHECK BAR TO BE ADJUSTED AND FITTED AT WINDOW CENTER AS SHOWN ABOVE AFTER INSTALLATION OF PINTLE NUT.
2104301 - 20/21

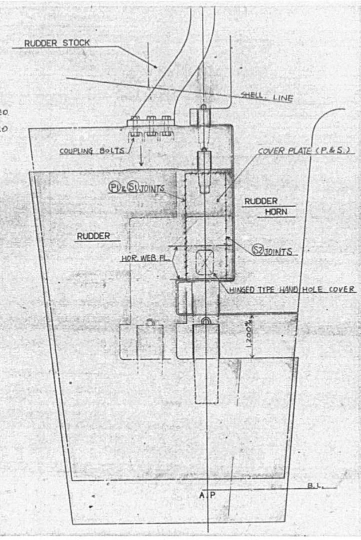


STEP 3
(WINCH)
(WINCH)
STEP 4
(WINCH)
REMOVAL PROCEDURE OF RUDDER, STOCK AND PINTLES
REMOVAL PROCEDURE OF RUDDER STOCK
① RUDDER TO BE TURNED TO THE PORT/STAR'BD SIDE (35°).
② COUPLING BOLTS TO BE REMOVED.
③ RUDDER STOCK TO BE TURNED TO THE STAR'BD/PORT SIDE (50°).
④ RUDDER CARRIER TO BE DISCONNECTED FROM RUDDER STOCK.
⑤ RUDDER STOCK TO BE DISMOUNTED VERTICALLY AT FIRST AND A LITTLE INCLINED AFTERWARDS AS SHOWN BELOW.
RUDDER CARRIER
ST.G.FLAT
A.P.
RUDDER
RUDDER
UPPER PINTLE
UPP. HAND HOLE COVER PLATE
NUT
RUDDER
COVER PLATE
DETAIL
LOWER PINTLE
HINGED TYPE HAND HOLE
LOW. HAND HOLE COVER PLATE
NUT
RUDDER HORN
RUDDER
S1 JOINT
LOW. PINTLE
AP
S2 JOINT
COVER PLATE
HINGED TYPE HAND COVER
REMOVAL PROCEDURE OF PINTLES
LOW. PINTLE
① RUDDER TO BE TURNED TO THE PORT SIDE (35°).
② LOW. HAND HOLE (S. SIDE) COVER PLATE TO BE CUT OUT.
③ HINGED TYPE HAND HOLE COVER (S. SIDE) TO BE OPENED.
④ HOR. WEB PLATES (S. SIDE ONLY) TO BE CUT OUT (REF. TO MARKED WELD ON PAGE 7, SEC. C - E).
⑤ S1 & S2 JOINTS TO BE CUT OUT AND COVER PLATE (S. SIDE) TO BE REMOVED.
⑥ LOW. PINTLE NUT TO BE REMOVED.
⑦ LOW. PINTLE TO BE JACKED UP, LIFTED USING EYES AND SHIFTED SIDEWAYS AS SHOWN LEFT.
UPP. PINTLE
① RUDDER TO BE TURNED TO THE PORT SIDE (35°).
② UPP. HAND HOLE (S. SIDE) COVER PLATE TO BE CUT OUT.
③ UPP. PINTLE NUT TO BE REMOVED.
④ UPP. PINTLE TO BE JACKED UP AND DISMOUNTED UPWARDS USING TOP EYE.
2104301 - 21/21

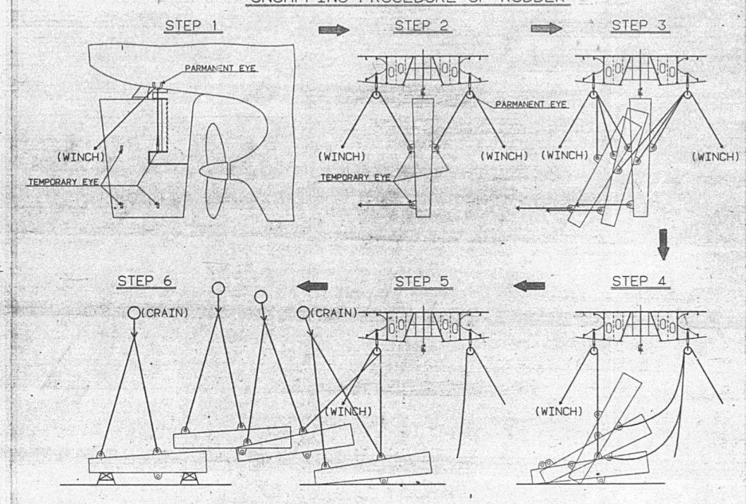
1/2 984

REMOVAL PROCEDURE OF RUDDER

1. RUDDER TO BE TURNED TO THE PORT/STAR'BD (15°)
2. PORT/STAR'BD HINGED TYPE HAND HOLE COVER TO BE OPENED
3. HOR. WEB PLATES TO BE CUT OUT (REF. TO ⌀ & ⌀ MARKED WELD ON PAGE 7, SEC. Ⓒ~Ⓕ).
4. Ⓟ1 & Ⓢ1 JOINTS TO BE CUT.
5. RUDDER TO BE TURNED TO THE PORT SIDE (35°).
6. Ⓢ2 JOINT TO BE CUT OUT AND COVER PLATES (P & S.) TO BE REMOVED.
7. COUPLING BOLTS TO BE REMOVED.
8. RUDDER TO BE DROPPED VERTICALLY (MIN. 1200 m/m).
9. RUDDER TO BE REMOVED TO SIDEWAYS (SEE STEPS 1 TO 6)



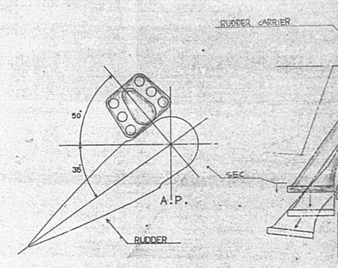
UNSHPPING PROCEDURE OF RUDDER



REMOVAL PROCEDURE OF RUDDER STOCK

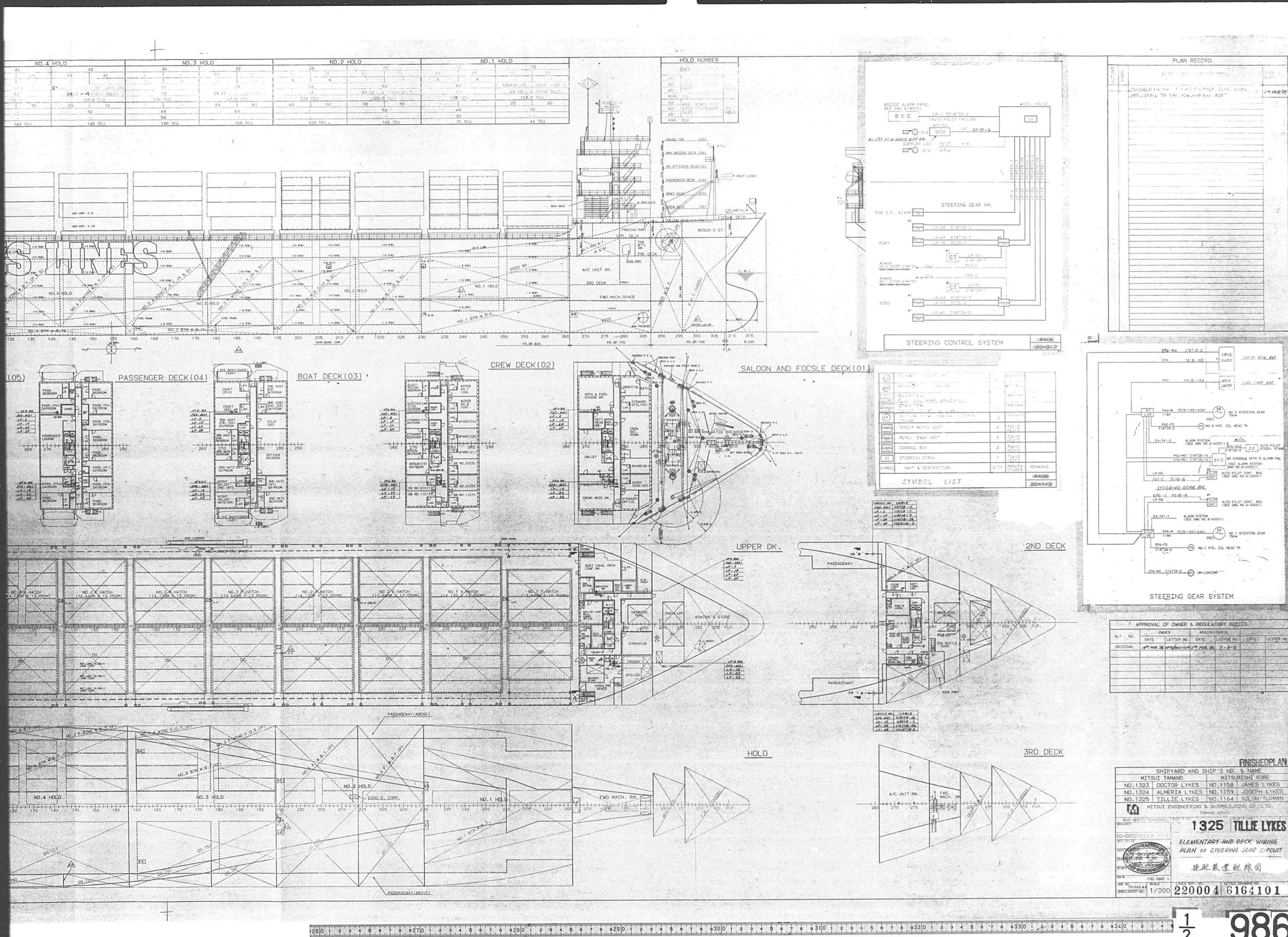
1. RUDDER TO BE TURNED TO THE PORT/STAR'BD SIDE (35°).
2. COUPLING BOLTS TO BE REMOVED.
3. RUDDER STOCK TO BE TURNED TO THE STAR'BD/PORT SIDE (50°).
4. RUDDER CARRIER TO BE DISCONNECTED FROM RUDDER STOCK.
5. RUDDER STOCK TO BE DISMOUNTED VERTICALLY AT FIRST AND A LITTLE INCLINED AFTERWARDS AS SHOWN BELOW.

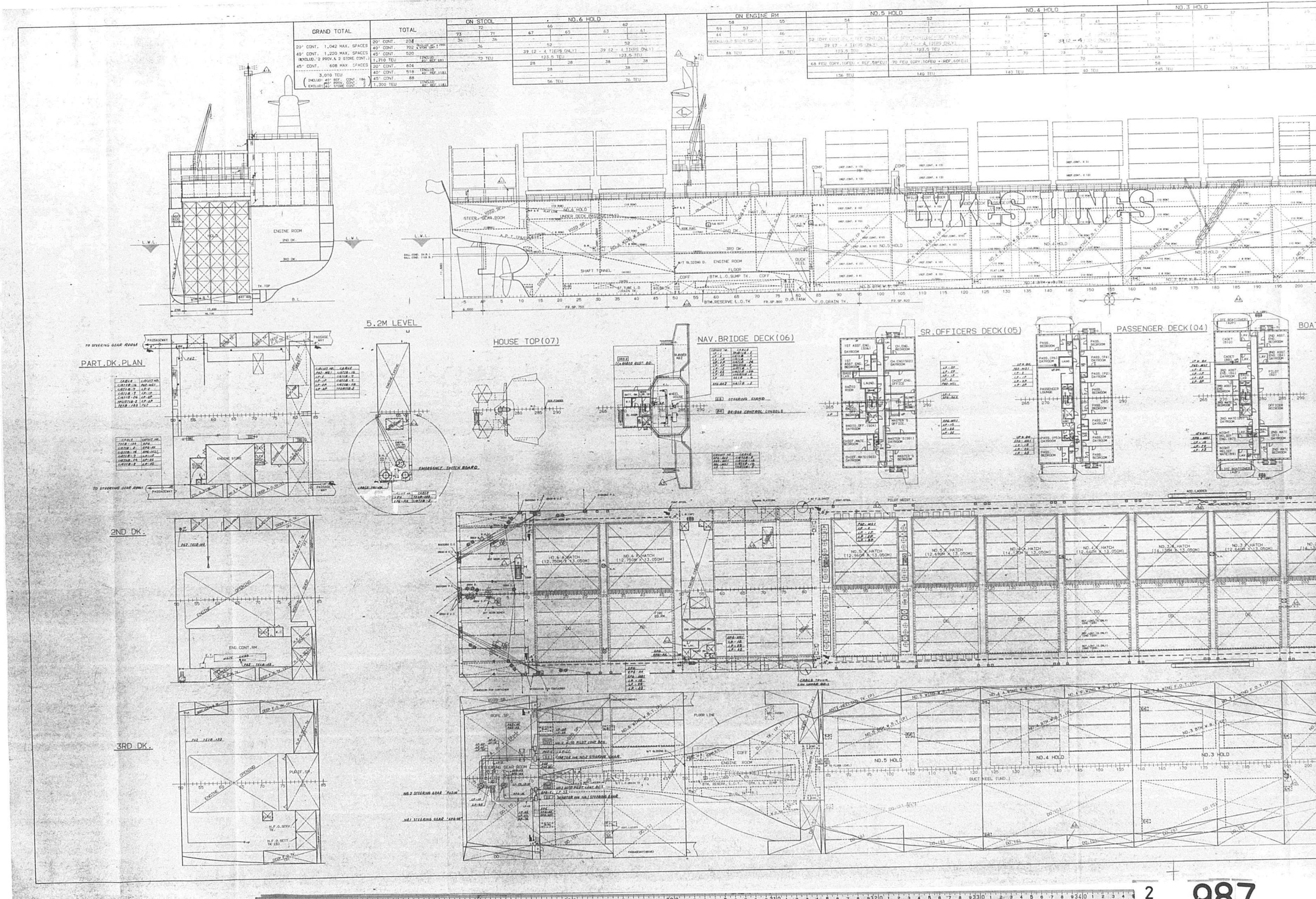
REMOV



2/2

985


NO.4 HOLD
NO.3 HOLD
NO.2 HOLD
NO.1 HOLD
HOLD NUMBER
PASSENGER DECK(04)
BOAT DECK(03)
CREW DECK(02)
SALOON AND FOCSLE DECK(01)
UPPER DK.
2ND DECK
HOLD
3RD DECK
STEERING CONTROL SYSTEM
SYMBOL LIST
STEERING GEAR SYSTEM
PLAN RECORD
APPROVAL OF OWNER & REGULATORY BODIES
FINISHEDPLAN
SHIPYARD AND SHIP'S NO. & NAME
MITSUI TAMANO
MITSUBISHI KOBE
NO.1323 DOCTOR LYKES
NO.1324 ALMERIA LYKES
NO.1325 TILLIE LYKES
NO.1158 JAMES LYKES
NO.1159 JOSEPH LYKES
NO.1164 SOLON TURMAN
MITSUI ENGINEERING & SHIPBUILDING CO.,LTD.
TAMANO WORKS
1325 TILLIE LYKES
ELEMENTARY AND DECK WIRING
PLAN OF STEERING GEAR CIRCUIT
操舵装置配線図
SCALE 1/200
LYKES REF. NO. 220004
MITSUI DRAWING NO. 6164101
1/2
986


GRAND TOTAL
TOTAL
ON STOOL
NO.6 HOLD
ON ENGINE RM
NO.5 HOLD
NO.4 HOLD
NO.3 HOLD
LYKES LINES
ENGINE ROOM
SHAFT TUNNEL
5.2M LEVEL
HOUSE TOP(07)
NAV.BRIDGE DECK(06)
SR.OFFICERS DECK(05)
PASSENGER DECK(04)
BOAT
PART.DK.PLAN
2ND DK.
3RD DK.
ENGINE STORE
ENG.CONT.RM
PURIF.RM
EMERGENCY SWITCH BOARD
NO.5 HOLD
NO.4 HOLD
NO.3 HOLD

2/2 987

APPROVAL OF OWNER & REGULATORY BODIES

ALT.NO.	OWNER		USCG		ABS		USPH	
	DATE	LETTER NO.	DATE	LETTER NO.	DATE	LETTER NO.	DATE	LETTER NO.
ORIGINAL	MAY 14 '85	OFTS/MES-397			13 AUG '85	T-8-2		
1 ST REVISED PLAN	[illegible] 4 '85	OFTS/MES-663			4 OCT '86	T-8-2		
1ST PART REV	16 AUG '86	TAM/40			15 OCT '86	T-8-2		
2ND PART REV	8 SEP '86	TAM/53			26 NOV '86	T-8-2		
3RD PART REV	12 MAR '86	TAM/162						

FINISHEDPLAN

SHIPYARD AND SHIP'S NO. & NAME			
MITSUI TAMANO		MITSUBISHI KOBE	
NO.1323	DOCTOR LYKES	NO.1158	JAMES LYKES
NO.1324	ALMERIA LYKES	NO.1159	JOSEPH LYKES
NO.1325	TILLIE LYKES	NO.1164	SOLON TURMAN

MITSUI ENGINEERING & SHIPBUILDING CO.,LTD.
TAMANO WORKS

SHIP DESIGN DEPARTMENT MANAGER	SHIP'S NO.	SHIP'S NAME
STRUCTURE DESIGN SEC.	1325	TILLIE LYKES

SEC.CHIEF / ASSIST.CHIEF / CHARGE ENG'R / STAFF: TE WAKIT... / DATE (TEL 2230)

前部機械室構造(下部)
FOR'D MACH. SPACE CONST. (LOW)

JOB NO. TS1323/24/25 JOBCLASSIF.NO.	SCALE	LYKES REF. NO.	MITSUI DRAWING NO.	
	1/100	220005	2103101	R

(9 SHEETS WITH COVER)

PLAN RECORD

ALT.NO.	MARK	ALTERATION/DESCRIPTION	DATE & SIGNATURE
		"PREPARED FOR S.NO.1323 AS FINISHED PLAN, CHANGED AS FOLLOWS.	
		△ ···· MISCELLANEOUS REVISION (DESIGN DEVELOPMENT) MADE APPLICABLE TO S.NO.1324 AND S.NO.1325."	NOV. 28.'86

DWG.NO. 2103101-1/

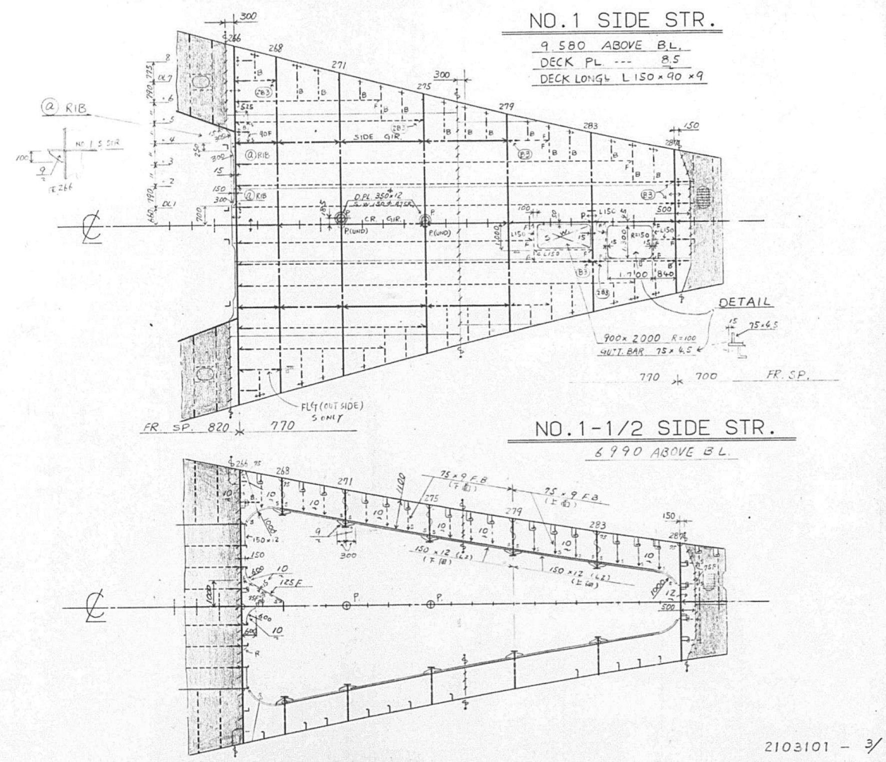
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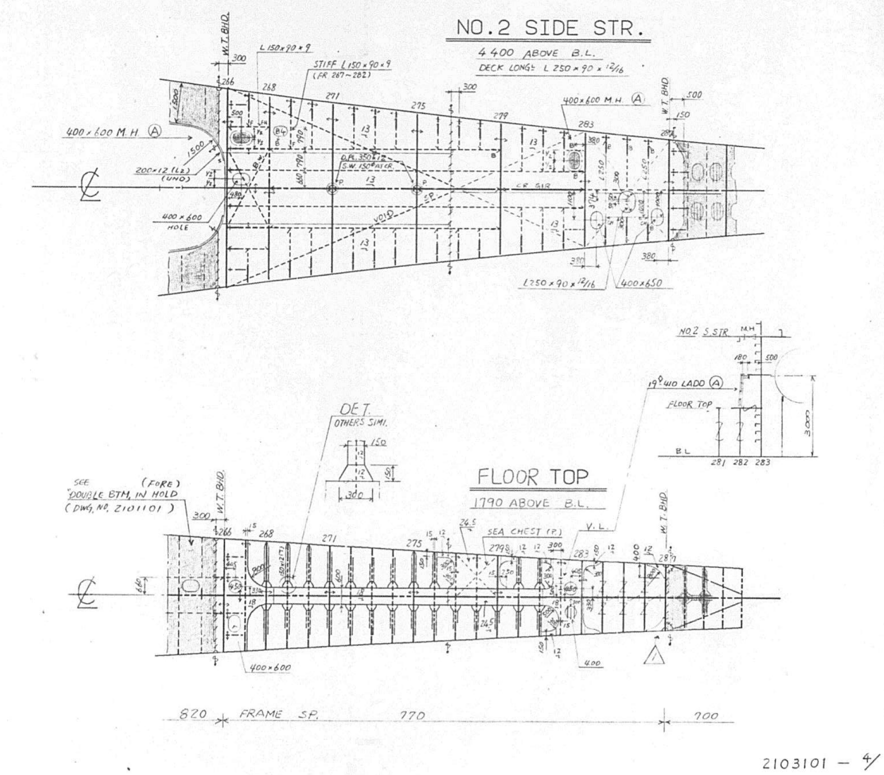
1. BOTH SIDES TO BE SYMMETRICAL EXCEPT SPECIFIED.
2. TRANS. SECTIONS TO BE "LOOKING FORE" EXCEPT SPECIFIED.
3. REFER TO "CONSTRUCTION DETAILS (DWG NO. 2100811)" FOR STRUCTURAL DETAILS OF MEMBERS, ETC. EXCEPT SPECIFIED.
4. REFER TO "WELDING TABLE (DWG NO. 2100832)" FOR LEG LENGTH OF WELDING EXCEPT SPECIFIED.

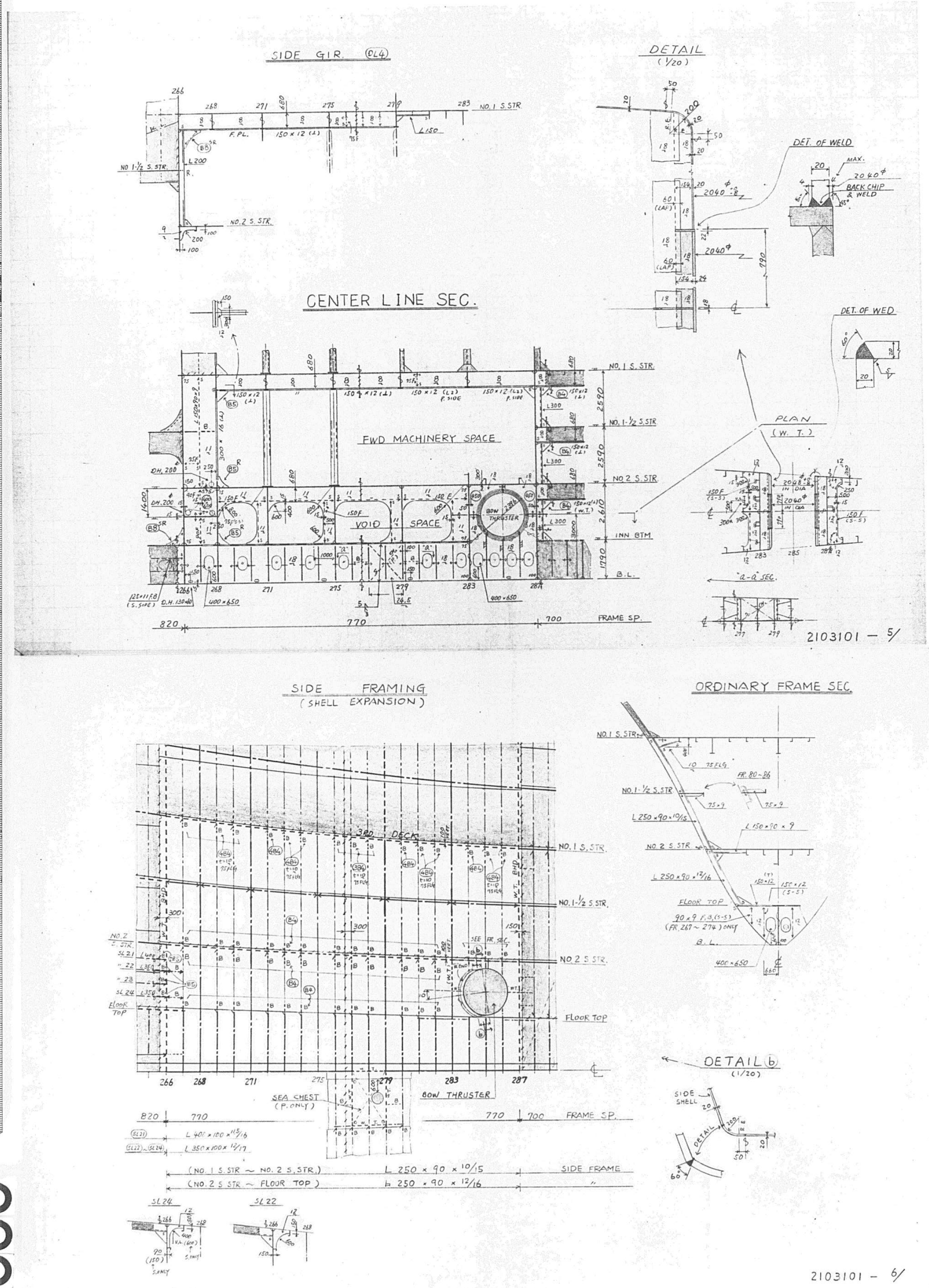
備 考:-

1. 特記の他は，両舷対称とする。
2. 横断面図は，特記の他は後面を示す。
3. 構造詳細については，特記の他は '構造詳細図(図番 2100811)' を参照のこと。
4. 溶接脚長については，特記の他は '溶接脚長表(図番 2100832)' を参照のこと。

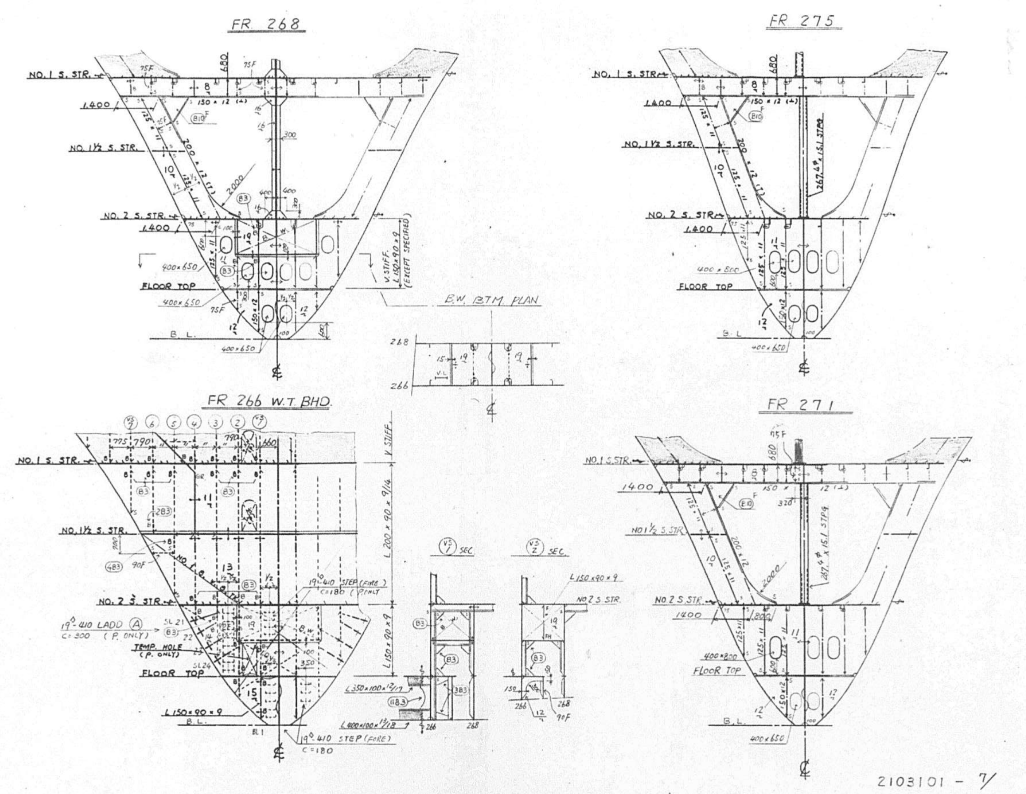
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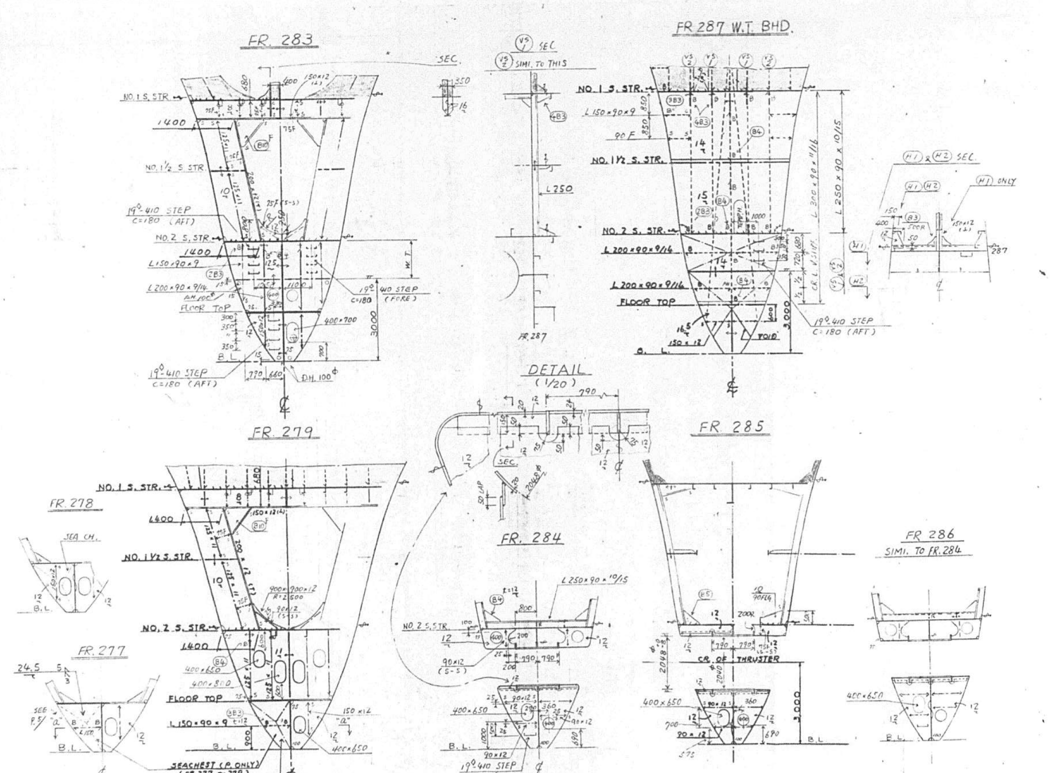

NO.1 SIDE STR.
9 580 ABOVE B.L.
DECK PL --- 8.5
DECK LONGL L150×90×9
DETAIL
900×2000 R=100
HALF.BAR 75×4.5
770 700 FR. SP.
FR. SP. 820 770
NO.1-1/2 SIDE STR.
6 990 ABOVE B.L.
75×9 F.B
150×12
2103101 – 3/


NO.2 SIDE STR.
4 400 ABOVE B.L.
DECK LONGL L250×90×12/16
STIFF L150×90×9 (FR. 267–282)
400×600 M.H. Ⓐ
200×12 (L2) (UNO)
400×600 HOLE
L250×90×12/16
400×650
W.T. BHD
FLOOR TOP
1790 ABOVE B.L.
DET.
OTHERS SIMI.
SEA CHEST (P)
V.L.
SEE (FORE) DOUBLE BTM. IN HOLD (DWG. NO. 2101101)
NO.2 S.STR
FLOOR TOP
B.L.
281 282 283
400×600
820 FRAME SP. 770 700
2103101 – 4/


SIDE GIR. (DL4)
DETAIL (1/20)
DET. OF WELD
CENTER LINE SEC.
DET. OF WED
FWD MACHINERY SPACE
VOID SPACE
BOW THRUSTER
PLAN (W. T.)
"a-a" SEC.
NO. 1 S. STR.
NO. 1-1/2 S. STR.
NO. 2 S. STR.
INN BTM
B.L.
FRAME SP.
2103101 - 5/
SIDE FRAMING (SHELL EXPANSION)
ORDINARY FRAME SEC.
DECK
FLOOR TOP
SEA CHEST (P. ONLY)
DETAIL (b) (1/20)
SIDE SHELL
SIDE FRAME
(NO. 1 S. STR ~ NO. 2 S. STR.) L 250 × 90 × 10/15
(NO. 2 S. STR ~ FLOOR TOP) L 250 × 90 × 12/16
SL 24
SL 22
2103101 - 6/

990


FR 268
FR 275
E.W. BTM PLAN
FR 266 W.T BHD
FR 271
NO. 1 S. STR.
NO. 1½ S. STR.
NO. 2 S. STR.
FLOOR TOP
B.L.
2103101 - 7/


FR 283
FR 287 W.T BHD.
DETAIL (1/20)
FR 279
FR 278
FR 277
FR 284
FR 285
FR 286
SIMI. TO FR 284
CG OF THRUSTER
SEACHEST (P. ONLY) (FR 277 ~ 279)
2103101 - 8/8

991

PLAN RECORD				
DWG NO.	MARK	DESCRIPTION	DATE	BY
ORIG.		FOLLOWED MES ORIGINAL PLAN	APR. 23 '85	
-10		Do. 1ST REVISED PLAN	JUN. 5 '85	
-11		FOLLOWED MES PARTLY REVISED PLAN NO. A1	JUL. 31 '85	
-12		PREPARED TO MODIFICATION FOR MHI BUILDING SHIPS. 1. SHAFTED SEAM JOINTS ON NO.2 SIDE STR. 2. ADDED SLOTS ON NO.1 & NO.1-1/2 SIDE STR.	AUG. 29 '85	
-13		FOLLOWED MES PARTLY REVISED PLAN NO. A3	MAR. 10 '86	
-F	-	PREPARED AS FINISHED PLAN FOR S. No. 1158	MAR. 11 '87	

10 SHEETS WITH COVER

SHIP DESIGNING DEPARTMENT
HULL DESIGNING SECTION

APPROVED: Y. Hirayama, H. Kokawa
CHECKED: S. Furuhashi
DRAWN
SCALE

CLASS ABS

前部機械室構造(下部)
FOR'D MACH. SPACE CONST. (LOW)

ORDER: 01-15800 ~~01-15900~~ ~~01-16400~~
DRAWING NO.: HS-45420-F
LYKES REF. NO.: 220005

MITSUBISHI HEAVY INDUSTRIES, LTD.
KOBE SHIPYARD & ENGINE WORKS

APPROVAL OF OWNER & REGULATORY BODIES								
ALT. NO.	OWNER		USCG		ABS		USPH	
	DATE	LETTER NO.	DATE	LETTER NO.	DATE	LETTER NO.	DATE	LETTER NO.
ORIGINAL	MAY 16 '85	OFTS/MES-399						
1ST REVISED PLAN	July 4 '85	OFTS/MES-663						

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SHIPYARD AND SHIP'S NO. & NAME			
~~MITSUI TAMANO~~		MITSUBISHI KOBE	
~~NO. 1323~~	~~DOCTOR LYKES~~	NO. 1158	JAMES LYKES
~~NO. 1324~~	~~ALMERIA LYKES~~	~~NO. 1159~~	~~JOSEPH LYKES~~
~~NO. 1325~~	~~TILLIE LYKES~~	~~NO. 1164~~	~~SOLON TURMAN~~

MITSUI ENGINEERING & SHIPBUILDING CO., LTD.
TAMANO WORKS

SHIP DESIGN DEPARTMENT
STRUCTURE DESIGN SEC.
ASSIST. CHIEF: Y. Idayoshi
STAFF: K. Miyoshi
DATE: '61.3.3 (TEL 2230)
JOB NO.: TS1323/24/25
SCALE: 1/100

PARTLY REVISED PLAN NO. 3

前部機械室構造(下部)
FOR'D MACH. SPACE CONST. (LOW)

LYKES REF. NO.: 220005
MITSUI DRAWING NO.: 2103101-A3

(3 SHEETS WITH COVER)

PLAN RECORD			
ALT. NO.	MARK	ALTERATION/DESCRIPTION	DATE & SIGNATURE
ORIGINAL		PREPARED FOR APPROVAL OF OWNER & A.B.S.	FEB. 27 '85
A	A	MISCELLANEOUS RIVESION (DESIGN DEVELOPMENT)	MAY 27 '85 J.
A1	A1	MISCELLANEOUS RIVESION (DESIGN DEVELOPMENT)	AUG. 28 '85 M.O.
A2			
A3	A3	MISCELLANEOUS RIVESION (OWNER'S REQUIREMENT)	MAR. 3 '86 H.M.

DWG. NO. 2103101 - 1/2

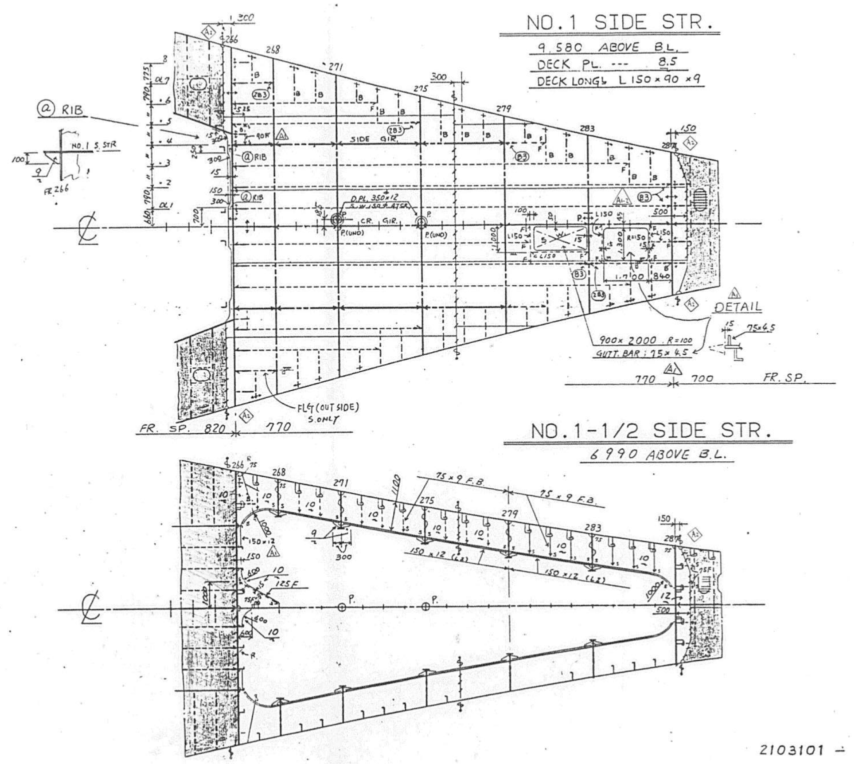
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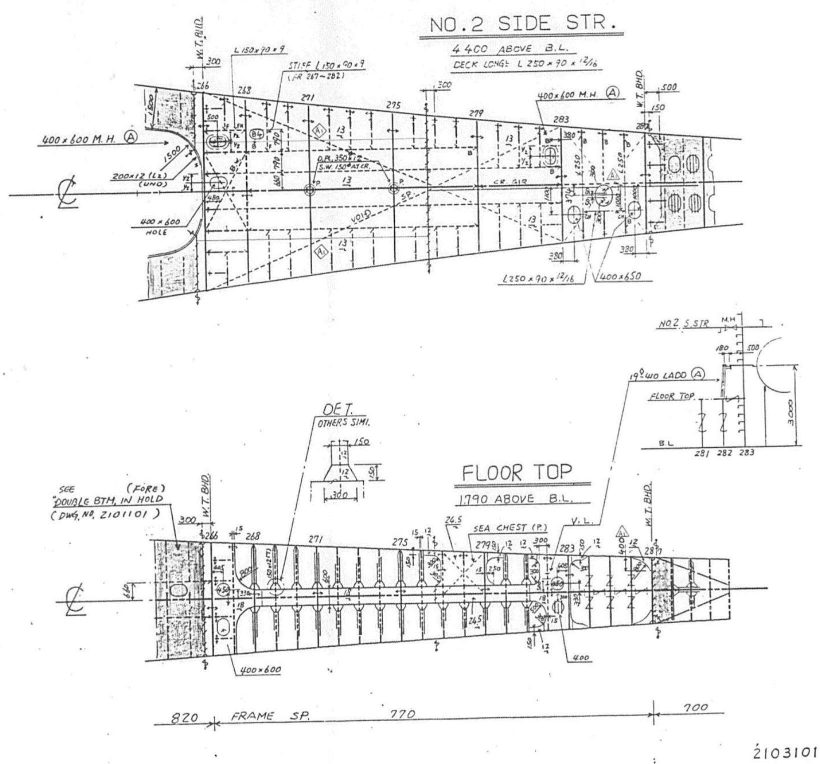
1. BOTH SIDES TO BE SYMMETRICAL EXCEPT SPECIFIED.
2. TRANS. SECTIONS TO BE "LOOKING FORE" EXCEPT SPECIFIED.
3. REFER TO "CONSTRUCTION DETAILS (DWG NO. 2100811)" FOR STRUCTURAL DETAILS OF MEMBERS, ETC. EXCEPT SPECIFIED.
4. REFER TO "WELDING TABLE (DWG NO. 2100832)" FOR LEG LENGTH OF WELDING EXCEPT SPECIFIED.

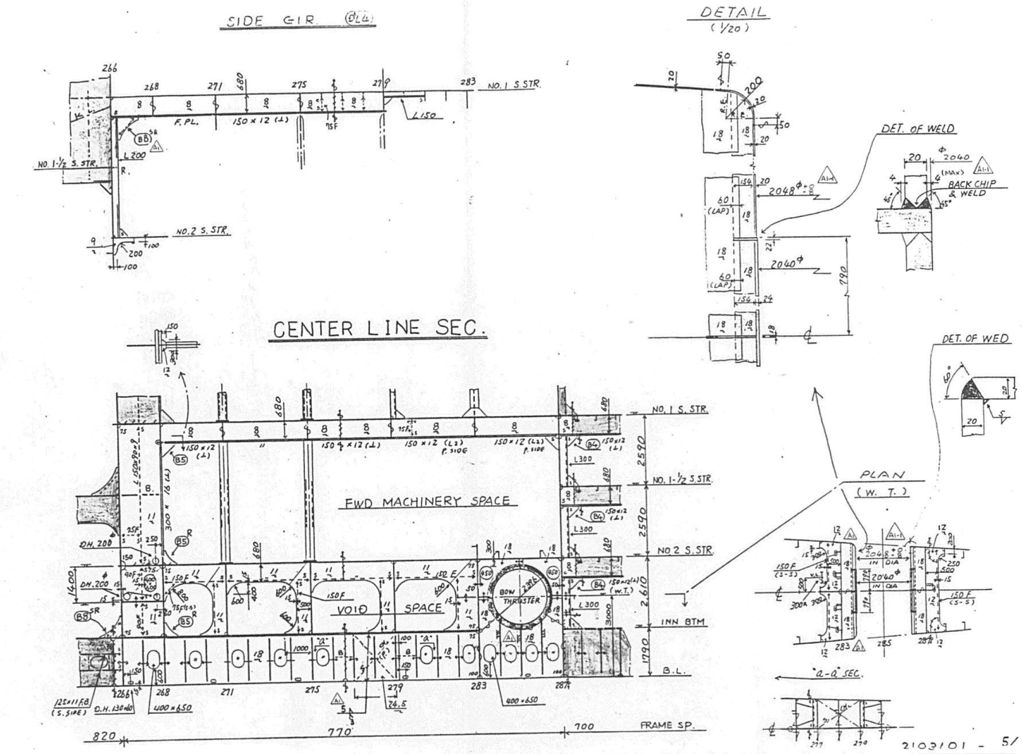
備 考:-

1. 特記の他は，両舷対称とする。
2. 横断面図は，特記の他は後面を示す。
3. 構造詳細については，特記の他は『構造詳細図(図番2100811)』を参照のこと。
4. 溶接脚長については，特記の他は『溶接脚長表(図番2100832)』を参照のこと。

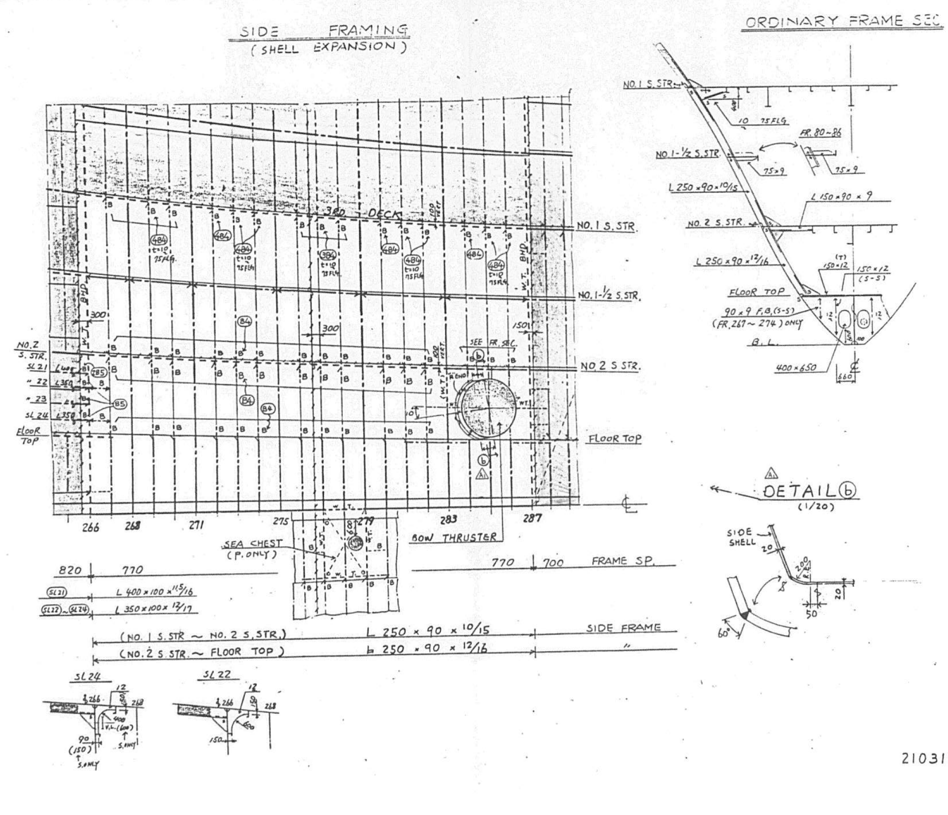
2103101 - 2/


NO.1 SIDE STR.
9 580 ABOVE B.L.
DECK PL. --- 8.5
DECK LONGL L 150 × 90 × 9
@ RIB
NO.1 S. STR
SIDE GIR.
CR. GIR.
DETAIL
900× 2000 R=100
GUTT. BAR : 75× 4.5
FL4 (OUT SIDE) S.ONLY
FR. SP. 820 770
770 700 FR. SP.
NO.1-1/2 SIDE STR.
6 990 ABOVE B.L.
75 × 9 F.B.
150 × 12
150 × 12 (L2)
2103101 - 3/

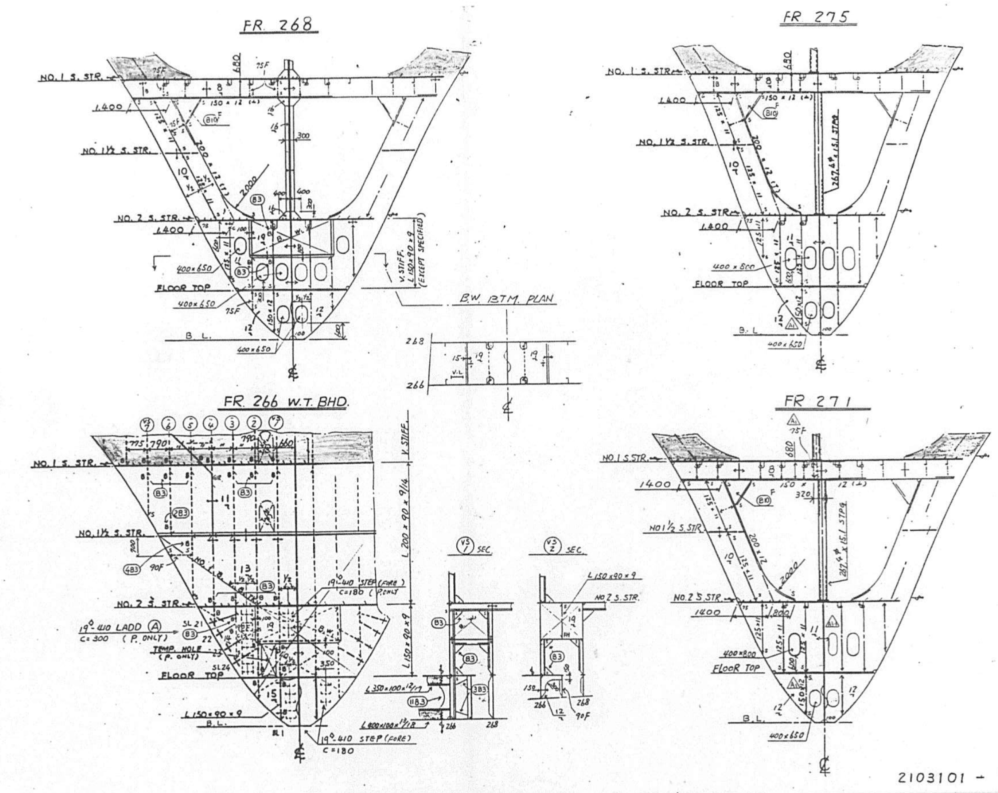

NO.2 SIDE STR.
4 400 ABOVE B.L.
DECK LONGL L 250 × 90 × 12/16
W. T. BHD.
L 150 × 90 × 9
STIFF L 150 × 90 × 9
400 × 600 M.H. Ⓐ
200 × 12 (L2) (UNO)
400 × 600 HOLE
CR. GIR
L 250 × 90 × 12/16
400 × 650
NO.2 S.STR
19φ WO LADD Ⓐ
FLOOR TOP
B.L.
281 282 283
DET.
OTHERS SIMI.
FLOOR TOP
1790 ABOVE B.L.
SEE (FORE) DOUBLE BTM. IN HOLD (DWG. NO. 2101101)
SEA CHEST (P)
V.L.
400 × 600
820 FRAME SP. 770 700
2103101 - 4/

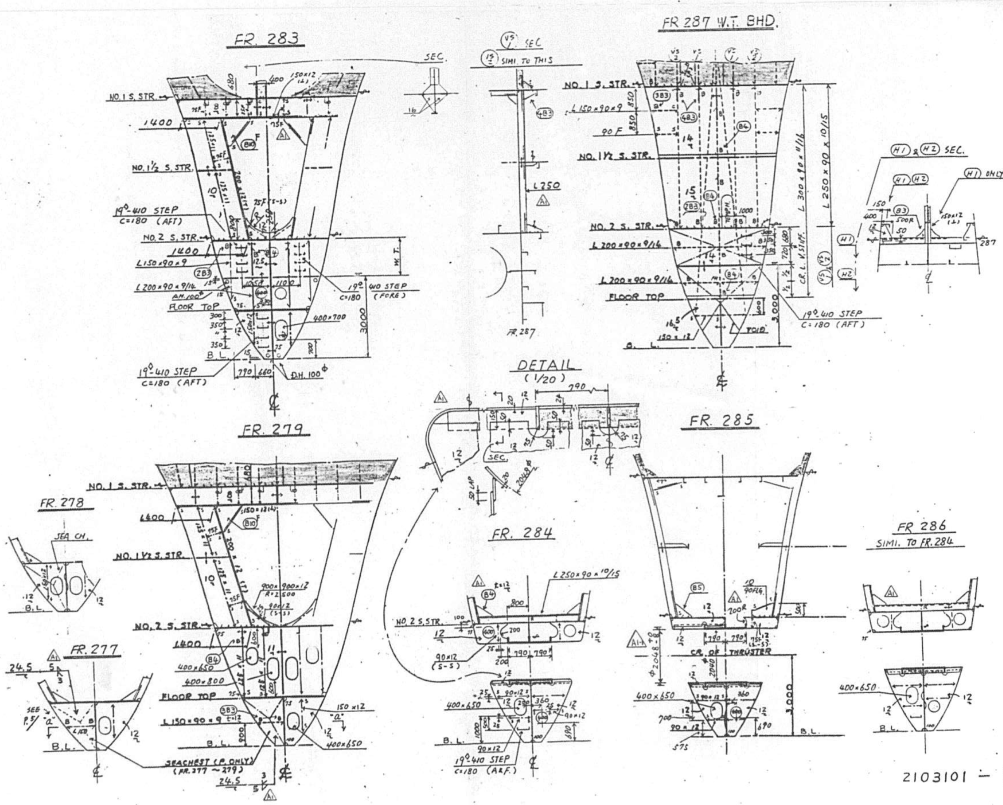


2103101 - 51



2103101 - 61


FR. 268
FR. 275
B.W. BTM. PLAN
FR. 266 W.T. BHD.
FR. 271
NO. 1 S. STR.
NO. 1½ S. STR.
NO. 2 S. STR.
FLOOR TOP
B.L.
2103101 - 7/


FR. 283
FR 287 W.T. BHD.
DETAIL (1/20)
FR. 279
FR. 278
FR. 277
FR. 284
FR. 285
FR. 286
SIMI. TO FR. 284
CR. OF THRUSTER
SEACHEST (P. ONLY) (FR. 277 ~ 279)
NO. 1 S. STR.
NO. 1½ S. STR.
NO. 2 S. STR.
FLOOR TOP
B.L.
2103101 - 8/8

APPROVAL OF OWNER & REGULATORY BODIES								
ALT.NO.	OWNER		USCG		ABS		USPH	
	DATE	LETTER NO.	DATE	LETTER NO.	DATE	LETTER NO.	DATE	LETTER NO.
ORIGINAL	9 July '86	OFTS/MES-1284						
REV. A	18 July '86	OFTS/MES-1288						

SHIPYARD AND SHIP'S NO. & NAME			
MITSUI TAMANO		MITSUBISHI KOBE	
NO.1323	DOCTOR LYKES	NO.1158	JAMES LYKES
NO.1324	ALMERIA LYKES	NO.1159	JOSEPH LYKES
NO.1325	TILLIE LYKES	NO.1164	SOLON TURMAN

MITSUI ENGINEERING & SHIPBUILDING CO.,LTD.
TAMANO WORKS

FINISHED PLAN

SHIP DESIGN DEPARTMENT
MANAGER

SHIP'S NO. **1325**

SHIP'S NAME **TILLIE LYKES**

CO-ORDINATION SECTION
SEC. CHIEF
ASSIST. CHIEF
CHARGE ENG'R
STAFF
DATE (TEL)

MANEUVERING INFORMATION BOOKLET

JOB NO. TS1323/24/25
SCALE
JOBCLASSIF.NO.
LYKES REF. NO. 240301
MITSUI DRAWING NO. 1102134

(25 SHEETS WITH COVER)

PLAN RECORD

ALT.NO.	MARK	ALTERATION/DESCRIPTION	DATE & SIGNATURE
		PREPARED FOR S. NO. 1325 AS FINISHED PLAN.	NOV. 10, 1986 K.A.

GENERAL NOTE

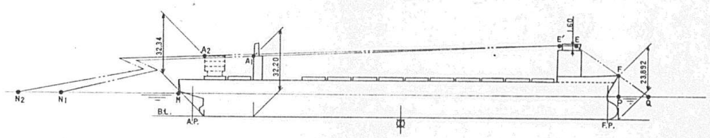
1. RESULTS OF THE FOLLOWING TESTS ARE OF "DOCTOR LYKES" SINCE THOSE TESTS WERE OMITTED ON THE "TILLIE LYKES".

   STOPPING TEST
   "Z" MANEUVERING TEST

2. THE MANEUVERING CHARACTERISTIC OF "DOCTOR LYKES" (PAGE 24) MAY BE APPLIED TO "TILLIE LYKES" EVEN THOUGH MINOR DIFFERENCE OF TRIAL RESULTS HAVE BEEN OBSERVED BETWEEN THE TWO VESSELS.

: CONTENTS :

2. NAUTICAL PLAN



PRINCIPAL DIMENSIONS

LENGTH (O.A.)	259.00 m
LENGTH (P.P.)	245.00 m
BREADTH (MLD.)	32.20 m
DEPTH (MLD.)	18.80 m

POSITION OF E & E'

E : AT FR.285

E': AT FR.269

DISTANCE FROM E TO F	24.55 m
DISTANCE FROM E' TO A1	178.53 m
DISTANCE FROM E' TO A2	207.62 m

REMARKS :-

P - Q Distance from the extreme fore end of ship (P) to the point (Q) on the sea-level, that is a distance possible to see through the extreme fore end of ship (F) from the wheel house (E).

M - N1 Distance from the extreme aft end of ship (M) to the point (N1) on the sea-level, that is a distance possible to see through the aft end of top of engine casing (A1) from on the navigation bridge deck (E').

M - N2 Distance from the extreme aft end of ship (M) to the point (N2) on the sea-level, that is a distance possible to see through the aft end of top of container at bay No. 66 (A2) from on the navigation bridge deck (E').

NOTE: TRIMS WITH MINUS SIGN (-) INDICATE TRIM BY BOW.

1. PRINCIPAL PARTICULARS

Kind of ship	:	Single screw, motor driven, container ship
Type	:	Flush decker with F'cle, Semi-aft engine and forward bridge
Class	:	The American Bureau of Shipping ✠A1 (E), ✠ AMS, ACCU (Container Ship)
Length overall	:	259.0 m
Length between perpendiculars	:	245.00 m
Breadth moulded	:	32.200 m
Depth moulded	:	18.800 m
Load line draft (Keel draft)	:	11.920 m
Type of main engine	:	Mitsui B&W 9L80MCE x 1 set
M.C.R.	:	28,800 PS x 83.0 rpm
N.S.R.	:	25,500 PS x 79.7 rpm

AFTWARD SIGHT (IN METER)
(M - N1)

MEAN DRAFT (IN M.)	TRIM (IN METER) -1.0	-0.5	0.0	0.5	1.0	1.5	2.0	2.5	3.0
5.0	1116.6	1018.1	934.0	861.4	798.1	742.5	693.1	649.0	609.5
5.5	1095.5	998.7	916.0	844.7	782.5	727.7	679.2	635.9	597.0
6.0	1074.5	979.3	898.1	828.0	766.8	713.0	665.3	622.8	584.5
6.5	1053.4	959.9	880.1	811.2	751.2	698.3	651.4	609.6	572.0
7.0	1032.4	940.5	862.2	794.5	735.5	683.6	637.6	596.5	559.6
7.5	1011.3	921.2	844.2	777.8	719.8	668.9	623.7	583.3	547.1
8.0	990.3	901.8	826.2	761.0	704.2	654.1	609.8	570.2	534.6
8.5	969.2	882.4	808.3	744.3	688.5	639.4	595.9	557.0	522.1
9.0	948.2	863.0	790.3	727.6	672.8	624.7	582.0	543.9	509.7
9.5	927.1	843.6	772.4	710.8	657.2	610.0	568.1	530.7	497.2
10.0	906.1	824.2	754.4	694.1	641.5	595.2	554.2	517.6	484.7
10.5	885.0	804.9	736.4	677.4	625.8	580.5	540.3	504.5	472.2

FORWARD SIGHT (IN METER)
(P - Q)

MEAN DRAFT (IN M.)	TRIM (IN METER) -1.0	-0.5	0.0	0.5	1.0	1.5	2.0	2.5	3.0
5.0	33.7	34.3	35.0	35.6	36.2	36.9	37.5	38.1	38.8
5.5	32.8	33.4	34.0	34.7	35.3	35.9	36.6	37.2	37.8
6.0	31.9	32.5	33.1	33.7	34.4	35.0	35.6	36.3	36.9
6.5	31.0	31.6	32.2	32.8	33.4	34.0	34.7	35.3	36.0
7.0	30.0	30.7	31.3	31.9	32.5	33.1	33.7	34.4	35.0
7.5	29.1	29.7	30.3	30.9	31.6	32.2	32.8	33.4	34.1
8.0	28.2	28.8	29.4	30.0	30.6	31.2	31.9	32.5	33.1
8.5	27.3	27.9	28.5	29.1	29.7	30.3	30.9	31.5	32.2
9.0	26.4	27.0	27.6	28.2	28.8	29.4	30.0	30.6	31.2
9.5	25.5	26.0	26.6	27.2	27.8	28.4	29.0	29.7	30.3
10.0	24.5	25.1	25.7	26.3	26.9	27.5	28.1	28.7	29.3
10.5	23.6	24.2	24.8	25.4	26.0	26.6	27.2	27.8	28.4

AFTWARD SIGHT (IN METER)
(M - N2)

MEAN DRAFT (IN M.)	TRIM (IN METER) -1.0	-0.5	0.0	0.5	1.0	1.5	2.0	2.5	3.0
5.0	1435.8	1285.4	1161.4	1057.3	968.8	892.6	826.3	768.1	716.6
5.5	1409.8	1261.8	1139.9	1037.6	950.6	875.6	810.4	753.2	702.5
6.0	1383.7	1238.3	1118.4	1017.8	932.3	858.6	794.5	738.2	688.4
6.5	1357.6	1214.7	1096.9	998.1	914.0	841.6	778.6	723.3	674.4
7.0	1331.6	1191.2	1075.4	978.3	895.7	824.6	762.7	708.4	660.3
7.5	1305.5	1167.6	1053.9	958.5	877.4	807.6	746.8	693.4	646.2
8.0	1279.4	1144.0	1032.4	938.8	859.1	790.5	730.9	678.5	632.1
8.5	1253.4	1120.5	1010.9	919.0	840.8	773.5	715.0	663.5	618.0
9.0	1227.3	1096.9	989.4	899.3	822.6	756.5	699.1	648.6	604.0
9.5	1201.2	1073.4	967.9	879.5	804.3	739.5	683.1	633.7	589.9
10.0	1175.2	1049.8	946.4	859.7	786.0	722.5	667.2	618.7	575.8
10.5	1149.1	1026.2	924.9	840.0	767.7	705.5	651.3	603.8	561.7

3. RESULTS OF MANEUVERING TEST

3.1. TURNING CIRCLE TEST (79.7 RPM)

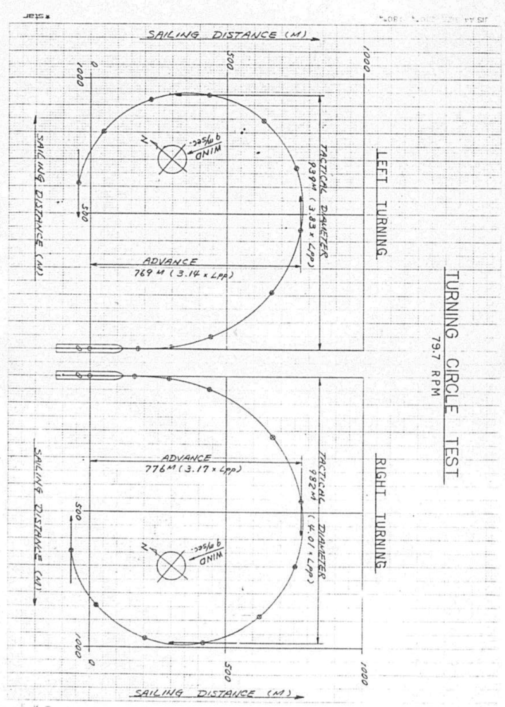
DATE	OCT. 21, 1986		DRAFT FORE	5.51 M
PLACE	KII STRAIT		DRAFT MIDSHIP	6.80 M
WEATHER	FINE		DRAFT AFT	8.51 M
SEA CONDITION	SLIGHT SEA		TRIM	3.00 M
DEPTH OF WATER	OVER 1000 M		DISPLACEMENT	31,020 MT
TURNING SIDE	LEFT	RIGHT	EQUIVALENT DRAFT (d)	6.95 M
TIME OF TEST	13°-21'	13°-0'	OUTPUT OF MAIN ENG.	NSR
ORIGINAL COURSE (deg.)	140	140	TYPE OF RUDDER	SEMI-BALLANCED
ORIGINAL R.P.M.	79.7	79.7	RUDDER AREA	54.16 M²
ORIGINAL SPEED (kts.)	20.8	21.4	RUDDER AREA UNDER W.L.	45.89 M²
RUDDER ANGLE (deg.)	P. 35	S. 35	Lxd / RUDD. AREA UNDER W.L.	37.11
MAX. HEEL ANGLE (deg.)	5	7		

LEFT TURNING

MARK	TURNING ANGLE	TIME TAKEN FROM ORDER (MIN. - SEC.)	ADVANCE (M)	TRANSFER (M)	R.P.M. OF MAIN ENGINE
①	5°	0 - 17	178	- 1	79.7
②	15°	0 - 28	299	- 8	"
③	30°	0 - 42	440	- 45	79
④	60°	1 - 12	664	- 211	75
⑤	90°	1 - 43	769	- 443	72
⑥	120°	2 - 16	752	- 669	70
⑦	150°	2 - 49	633	- 845	69
⑧	180°	3 - 26	436	- 939	69
⑨	210°	4 - 4	222	- 922	68
⑩	240°	4 - 41	48	- 803	"
⑪	270°	5 - 20	- 46	- 611	"
⑫	300°				
⑬	330°				
⑭	360°				

RIGHT TURNING

MARK	TURNING ANGLE	TIME TAKEN FROM ORDER (MIN. - SEC.)	ADVANCE (M)	TRANSFER (M)	R.P.M. OF MAIN ENGINE
①	5°	0 - 15	165	0	79.7
②	15°	0 - 27	292	9	78
③	30°	0 - 41	438	47	77
④	60°	1 - 12	669	220	75
⑤	90°	1 - 44	776	460	72
⑥	120°	2 - 19	754	699	70
⑦	150°	2 - 54	626	885	70
⑧	180°	3 - 33	419	982	69
⑨	210°	4 - 10	204	966	69
⑩	240°	4 - 49	25	844	68
⑪	270°	5 - 29	- 67	646	"
⑫	300°				
⑬	330°				
⑭	360°				



3.2. TURNING CIRCLE TEST (45 RPM)

DATE	OCT. 21, 1986		DRAFT FORE	5.51 M
PLACE	KII STRAIT		DRAFT MIDSHIP	6.80 M
WEATHER	FINE		DRAFT AFT	8.51 M
SEA CONDITION	SLIGHT SEA		TRIM	3.00 M
DEPTH OF WATER	OVER 1000 M		DISPLACEMENT	31,020 MT
TURNING SIDE	LEFT	RIGHT	EQUIVALENT DRAFT (d)	6.95 M
TIME OF TEST	14°-32'	14°-15'	OUTPUT OF MAIN ENG.	45 RPM
ORIGINAL COURSE (deg.)	140	140	TYPE OF RUDDER	SEMI-BALLANCED
ORIGINAL R.P.M.	45	45	RUDDER AREA	54.16 M²
ORIGINAL SPEED (kts.)	11.5	10.8	RUDDER AREA UNDER W.L.	45.89 M²
RUDDER ANGLE (deg.)	P. 35	S. 35	Lxd / RUDD. AREA UNDER W.L.	37.11
MAX. HEEL ANGLE (deg.)	5	7		

LEFT TURNING

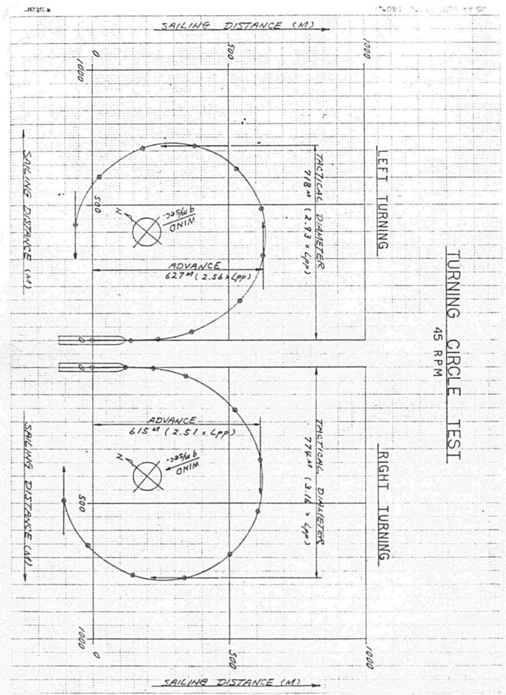
MARK	TURNING ANGLE	TIME TAKEN FROM ORDER (MIN. - SEC.)	ADVANCE (M)	TRANSFER (M)	R.P.M. OF MAIN ENGINE
①	5°	0 - 24	141	1	45
②	15°	0 - 42	242	- 3	"
③	30°	1 - 5	363	- 31	44
④	60°	1 - 54	541	- 148	"
⑤	90°	2 - 43	627	- 313	"
⑥	120°	3 - 34	622	- 487	"
⑦	150°	4 - 25	532	- 635	"
⑧	180°	5 - 19	373	- 718	"
⑨	210°	6 - 15	187	- 710	"
⑩	240°	7 - 14	26	- 604	"
⑪	270°	8 - 14	- 62	- 429	"
⑫	300°				
⑬	330°				
⑭	360°				

RIGHT TURNING

MARK	TURNING ANGLE	TIME TAKEN FROM ORDER (MIN. - SEC.)	ADVANCE (M)	TRANSFER (M)	R.P.M. OF MAIN ENGINE
①	5°	0 - 22	122	- 1	45
②	15°	0 - 40	222	2	44
③	30°	1 - 3	341	30	"
④	60°	1 - 50	523	155	"
⑤	90°	2 - 42	615	338	"
⑥	120°	3 - 36	604	529	"
⑦	150°	4 - 32	502	689	"
⑧	180°	5 - 28	337	774	"
⑨	210°	6 - 28	144	764	"
⑩	240°	7 - 30	- 19	656	"
⑪	270°	8 - 30	- 107	489	"
⑫	300°				
⑬	330°				
⑭	360°				

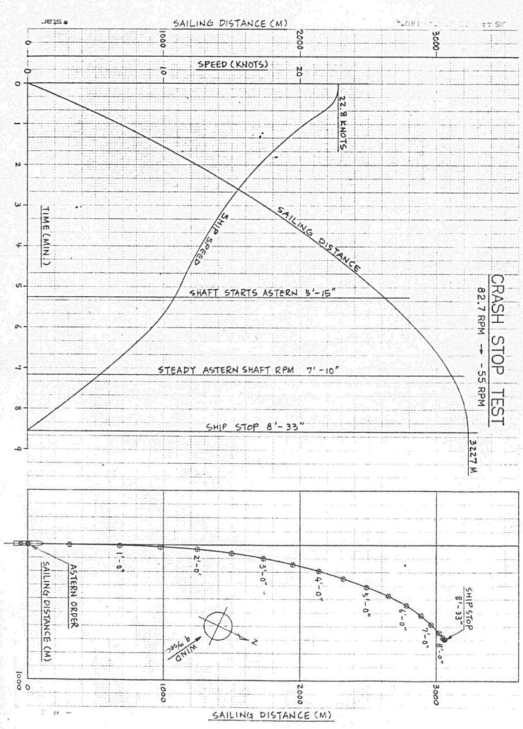
3.3. CRASH STOP TEST
(82.7 RPM → -55 RPM)

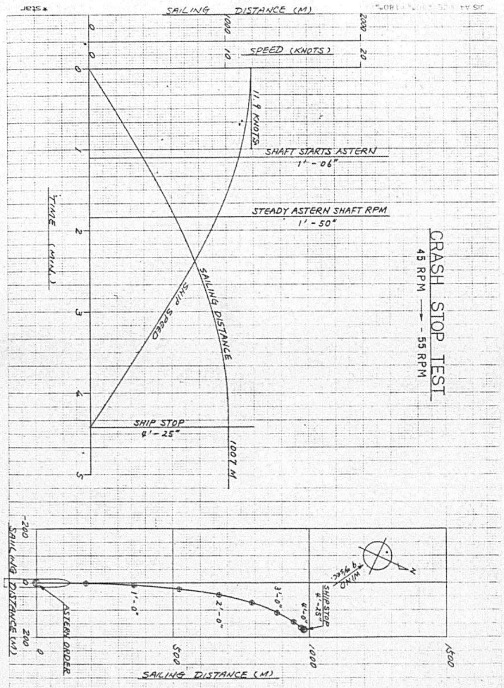
DATE	OCT. 21, 1996	DRAFT	FORE	5.51 M
PLACE	K11 STRAIT		MIDSHIP	6.80 M
WEATHER	FINE		AFT	8.51 M
SEA CONDITION	SLIGHT SEA	TRIM		3.00 M
DEPTH OF WATER	OVER 1000 M	DISPLACEMENT		31,020 MT
WIND	SE abt. 9 m/sec.			
TIME OF TEST				13° - 40′
ORIGINAL COURSE				335°
ORIGINAL AHEAD SPEED				22.8 knots
ORIGINAL AHEAD SHAFT R. P. M.				82.7 RPM
TIME FROM ORDER UNTIL SHAFT STOPS				5′ - 15″
TIME FROM ORDER UNTIL SHAFT STARTS ASTERN				5′ - 15″
TIME TO REACH NORMAL ASTERN SHAFT R.P.M.				7′ - 10″
TIME FROM ORDER UNTIL SHIP STOPS				8′ - 33″
TRAVEL FROM ORDER UNTIL SHIP STOPS				abt. 3227 M
STEADY ASTERN SHAFT R.P.M.				- 55 RPM



3.4. CRASH STOP TEST
(45 RPM → -55 RPM)

DATE	OCT. 21, 1996	DRAFT	FORE	5.51 M
PLACE	K11 STRAIT		MIDSHIP	6.80 M
WEATHER	FINE		AFT	8.51 M
SEA CONDITION	SLIGHT SEA	TRIM		3.00 M
DEPTH OF WATER	OVER 1000 M	DISPLACEMENT		31,020 MT
WIND	SE abt. 9 m/sec.			
TIME OF TEST				14° - 0″
ORIGINAL COURSE				335°
ORIGINAL AHEAD SPEED				11.9 knots
ORIGINAL AHEAD SHAFT R. P. M.				45 RPM
TIME FROM ORDER UNTIL SHAFT STOPS				1′ - 6″
TIME FROM ORDER UNTIL SHAFT STARTS ASTERN				1′ - 6″
TIME TO REACH NORMAL ASTERN SHAFT R.P.M.				1′ - 50″
TIME FROM ORDER UNTIL SHIP STOPS				4′ - 25″
TRAVEL FROM ORDER UNTIL SHIP STOPS				abt. 1007 M
STEADY ASTERN SHAFT R.P.M.				- 55 RPM





3.5. BOW THRUSTER TEST

DATE	OCT. 21, 1986	DRAFT	FORE	5.51 M
PLACE	KII STRAIT		MIDSHIP	6.80 M
WEATHER	FINE		AFT	8.51 M
SEA CONDITION	SLIGHT SEA	TRIM		3.00 M.
DEPTH OF WATER	OVER 1000 M	DISPLACEMENT		31,020 MT
WIND	SE abt. 12 m/sec.			

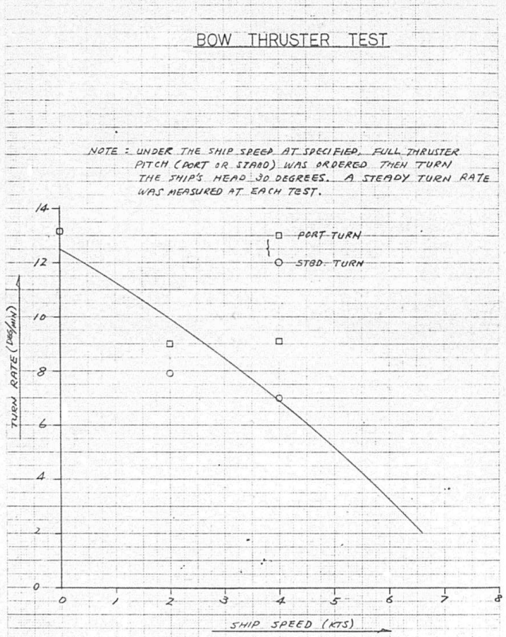
DESIGNED PARTICULARS

MAIN MOTOR		920 KW × 1200 RPM
THRUSTER :	PROPELLER DIA.	2000 MM
	REVOLUTION	267 RPM
	NO. OF BLADES	4
	THRUST	14.4 MT
HYDRAULIC UNIT :	MOTOR	3.7 KW × 1200 RPM
	OIL PUMP	35 l/MIN. × 35 Kg/cm²

RESULTS OF THE TEST

SHIP SPEED (KNOTS)	OPERATING	RESPONSE TIME (SEC)	HYD. OIL PRESSURE (Kg/cm²)	MAIN MOTOR VOLTAGE (V)	MAIN MOTOR AMPERAGE (A)	THRUSTER SHAFT REV (RPM)
0	0° → P25°	12.5	33	4130 ~ 3900	45 ~ 167	1180
	P25° → 0°	16.0	33			"
	0° → S25°	10.9	33	4130 ~ 3890	45 ~ 165	1180
	S25° → 0°	11.5	33			"
2	0° → P25°	12.8	32.5	4130 ~ 3900	45 ~ 153	1180
	P25° → 0°	15.0	33			"
	0° → S25°	11.1	33	4130 ~ 3850	45 ~ 165	1180
	S25° → 0°	12.5	33			"
4	0° → P25°	12.0	33	4130 ~ 3860	45 ~ 153	1180
	P25° → 0°	14.5	32			"
	0° → S25°	11.0	34	4130 ~ 3880	45 ~ 170	1180
	S25° → 0°	12.3	32			"
	0° → P25°					
	P25° → 0°					
	0° → S25°					
	S25° → 0°					

NOTE : ~ "RESPONSE TIME" IS PITCH RESPONSE TIME FROM 0 TO FULL.



M.V. "DOCTOR LYKES"

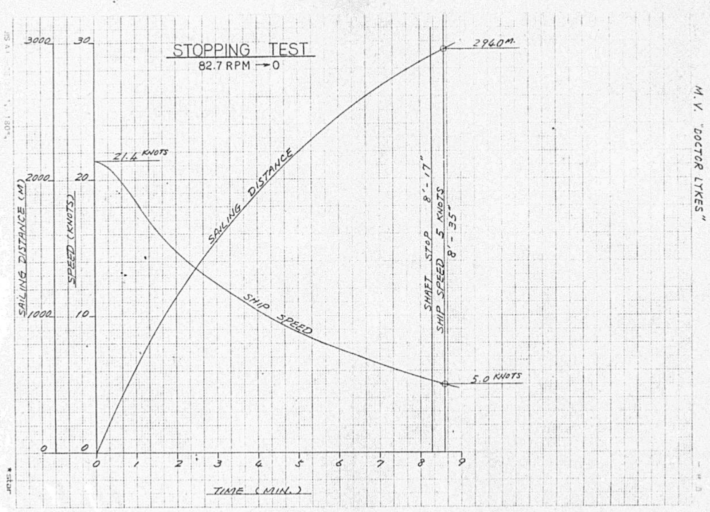
3.6. STOPPING TEST
(82.7 RPM → 0)

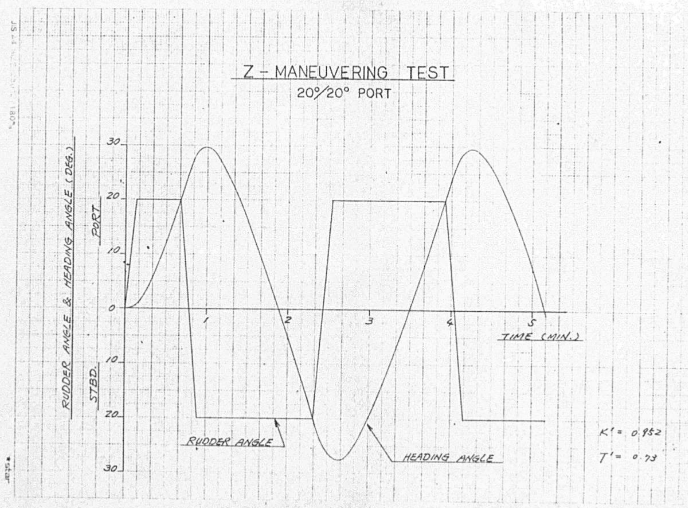
DATE	MARCH 18 1986	DRAFT	FORE	5.40 M
PLACE	KII STRAIT		MIDSHIP	6.89 M
WEATHER	CLOUDS		AFT	8.37 M
SEA CONDITION	MODERATE SEA	TRIM		2.97 M
WIND	E. 8 ~ 11 m/sec.	DISPLACEMENT		31,230 MT

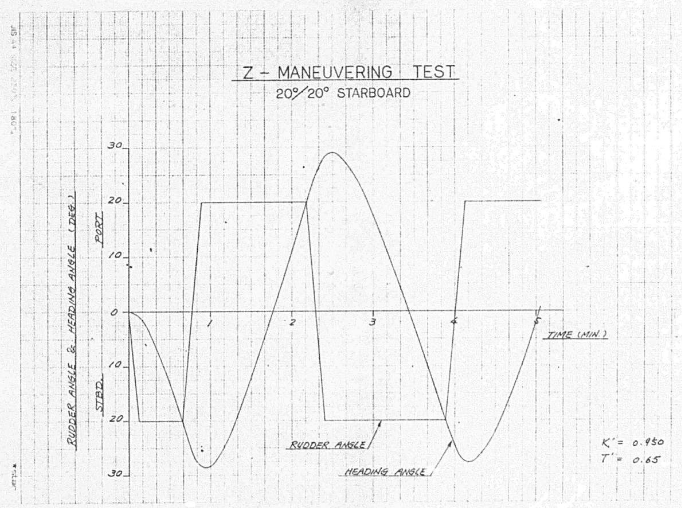
TIME OF TEST	22:35
ORIGINAL COURSE	100°
SHAFT R.P.M. JUST BEFORE ORDER "ENGINE STOP"	82.7 RPM
SHIP'S SPEED JUST BEFORE ORDER "ENGINE STOP"	21.4 KNOTS
TIME FROM ORDER UNTIL SHAFT STOPS	8'-17"
TIME FROM ORDER UNTIL SHIP'S SPEED BECOMES 5 KNOTS	8'-35"
TRAVEL FROM ORDER UNTIL SHIP'S SPEED BECOMES 5 KNOTS	abt. 2,940 M

3.7. **"Z" MANEUVERING TEST**

DATE		MARCH 18 1986
PLACE		KII STRAIT
TIME OF TEST		23 : 48
SEA CONDITION		MODERATE SEA
WEATHER		CLOUDS
WIND		E. 8 - 10 M/SEC.
DRAFT	FORE	5.40 M
	MIDSHIP	6.89 M
	AFT	8.37 M
TRIM		2.97 M
DISPLACEMENT		31,230 MT







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(END)

4. MANEUVERING CHARACTERISTICS

WARNING

THE RESPONSE OF THIS VESSEL MAY DIFFER FROM THAT LISTED BELOW IF ANY OF THE FOLLOWING CONDITIONS UPON WHICH THE MANEUVERING INFORMATION IS BASED, ARE VARIED

(1) CALM WEATHER-WIND 10 KNOTS OR LESS,CALMSEA
(2) NO CURRENT
(3) WATER DEPTH TWICE VESSEL'S DRAFT OR GREATER
(4) CLEAN HULL
(5) INTERMEDIATE DRAFTS OR UNUSUAL TRIM

MIN. STEERING SPEED

NORMAL LOADED CONDITION	abt. 6 KNOTS
NORMAL BALLAST CONDITION	abt. 6 KNOTS

MAX. AVAILABLE RUDDER

NORMAL LOADED CONDITION	35 DEGREES
NORMAL BALLAST CONDITION	35 DEGREES

TIME AND DISTANCE TO STOP

NOTE: USING ENGINE FULL ASTERN AND WITH MINIMUM APPLICATION OF RUDDER

	NORMAL LOADED CONDITION		NORMAL BALLAST CONDITION	
	TIME	DISTANCE	TIME	DISTANCE
MAX. SEA SPEED	9.6 MINUTES	1.68 MILES	7.6 MINUTES	1.38 MILES
FULL SPEED	6.8 MINUTES	0.87 MILES	5.4 MINUTES	0.72 MILES
HALF SPEED	5.8 MINUTES	0.63 MILES	4.6 MINUTES	0.52 MILES
SLOW SPEED	4.2 MINUTES	0.35 MILES	3.3 MINUTES	0.29 MILES

AUXILIARY DEVICES

BOW THRUSTER	
VESSEL SPEED	EFFECTIVENESS
0 TO 0.5 KNOTS	100 %
2 TO 3 KNOTS	75 %
4 TO 5 KNOTS	50 %
5 TO 6 KNOTS	25 %
ABOVE 6.5 KNOTS	0 %

DRAFTS

CONDITION	DRAFT		TRIM
	AFT	FORE	
NORMAL LOADED	10.29 M	10.29 M	0.0 M
NORMAL BALLAST	8.37 M	5.40 M	2.97 M

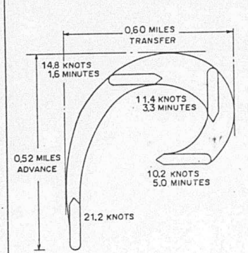
ENGINE ORDER	RPM	SPEED LOADED	SPEED BALLAST
MAX. SEA AHEAD	79.7	21.2 KNOTS	22.1 KNOTS
FULL AHEAD	55	14.3 KNOTS	14.8 KNOTS
HALF AHEAD	45	11.6 KNOTS	12.1 KNOTS
SLOW AHEAD	30	7.5 KNOTS	8.1 KNOTS
DEAD SLOW AHEAD	25	6.2 KNOTS	6.7 KNOTS
DEAD SLOW ASTERN	- 25		
SLOW ASTERN	- 30		
HALF ASTERN	- 45		
FULL ASTERN	- 55		

TURNING CIRCLE DIAGRAMS

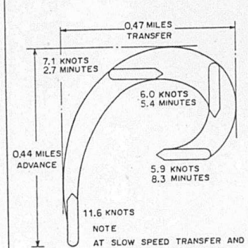
NOTE: THERE IS NO APPRECIABLE DIFFERENCE IN THE TIME OR DISTANCE OF ADVANCE AND TRANSFER WHEN MAKING A TURN TO PORT OR STARBOARD THEREFORE, ALL DIAGRAMS SHOW A STARBOARD TURN AND THE SAME INFORMATION WOULD APPLY WHEN MAKING A TURN TO PORT

NORMAL LOADED CONDITION

MAX. SEA SPEED (79.7PRM)



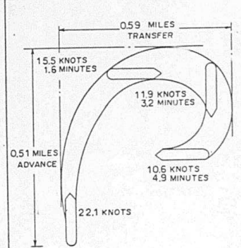
HALF SPEED (45 RPM)



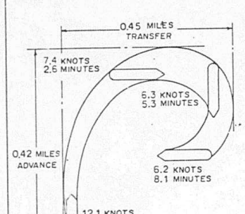
NOTE
AT SLOW SPEED TRANSFER AND ADVANCE ABOUT SAME AS HALF SPEED, BUT SPEEDS PROPORTIONALLY LESS AND TIMES PROPORTIONALLY GREATER.

NORMAL BALLAST CONDITION

MAX. SEA SPEED (79.7 RPM)



HALF SPEED (45 RPM)



NOTE
AT SLOW SPEED TRANSFER AND ADVANCE ABOUT SAME AS HALF SPEED, BUT SPEEDS PROPORTIONALLY LESS AND TIMES PROPORTIONALLY GREATER.

APPROVAL OF OWNER & REGULATORY BODIES								
ALT. NO.	OWNER		USCG		ABS		USPH	
	DATE	LETTER NO.	DATE	LETTER NO.	DATE	LETTER NO.	DATE	LETTER NO.
ORIGINAL	9 July '86	OFTS/MES 1284						
REV. A	17 July '86	OFTS/MES 1288						

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SHIPYARD AND SHIP'S NO. & NAME			
MITSUI TAMANO		MITSUBISHI KOBE	
NO.1323	DOCTOR LYKES	NO.1158	JAMES LYKES
NO.1324	ALMERIA LYKES	NO.1159	JOSEPH LYKES
NO.1325	TILLIE LYKES	NO.1164	SOLON TURMAN

MITSUI ENGINEERING & SHIPBUILDING CO., LTD.
TAMANO WORKS FINISHED PLAN

SHIP DESIGN DEPARTMENT MANAGER — SHIP'S NO. **1325** — SHIP'S NAME **TILLIE LYKES**

CO-ORDINATION SECTION
SEC. CHIEF
ASSIST. CHIEF 5, 1987
CHARGE
STAFF
DATE (TEL)

MANEUVERING DATA BOARD

JOB NO. TS1323/24/25	SCALE	LYKES REF. NO. 240302	MITSUI DRAWING NO. 1102135

(3 SHEETS WITH COVER)

PLAN RECORD			
ALT. NO.	MARK	ALTERATION/DESCRIPTION	DATE & SIGNATURE
		PREPARED FOR S. NO. 1323 AS FINISHED PLAN. MADE APPLICABLE TO S. NO. 1324 AND S. NO. 1325.	NOV. 10, 1986 K.A. MA

2 (END)

MANEUVERING CHARACTERISTICS

WARNING

THE RESPONSE OF THIS VESSEL MAY DIFFER FROM THAT LISTED BELOW IF ANY OF THE FOLLOWING CONDITIONS UPON WHICH THE MANEUVERING INFORMATION IS BASED, ARE VARIED

(1) CALM WEATHER-WIND 10 KNOTS OR LESS, CALM SEA
(2) NO CURRENT
(3) WATER DEPTH TWICE VESSEL'S DRAFT OR GREATER
(4) CLEAN HULL
(5) INTERMEDIATE DRAFTS OR UNUSUAL TRIM

MIN. STEERING SPEED

NORMAL LOADED CONDITION	abt. 6 KNOTS
NORMAL BALLAST CONDITION	abt. 6 KNOTS

MAX. AVAILABLE RUDDER

NORMAL LOADED CONDITION	35 DEGREES
NORMAL BALLAST CONDITION	35 DEGREES

TIME AND DISTANCE TO STOP

NOTE: USING ENGINE FULL ASTERN AND WITH MINIMUM APPLICATION OF RUDDER

	NORMAL LOADED CONDITION		NORMAL BALLAST CONDITION	
	TIME	DISTANCE	TIME	DISTANCE
MAX. SEA SPEED	9.6 MINUTES	1.68 MILES	7.6 MINUTES	1.38 MILES
FULL SPEED	6.8 MINUTES	0.87 MILES	5.4 MINUTES	0.72 MILES
HALF SPEED	5.8 MINUTES	0.63 MILES	4.6 MINUTES	0.52 MILES
SLOW SPEED	4.2 MINUTES	0.35 MILES	3.3 MINUTES	0.29 MILES

AUXILIARY DEVICES

BOW THRUSTER

VESSEL SPEED	EFFECTIVENESS
0 TO 0.5 KNOTS	100 %
2 TO 3 KNOTS	75 %
4 TO 5 KNOTS	50 %
5 TO 6 KNOTS	25 %
ABOVE 6.5 KNOTS	0 %

DRAFTS

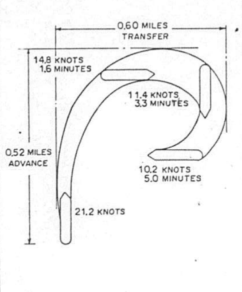
CONDITION	DRAFT AFT	DRAFT FORE	TRIM
NORMAL LOADED	10.29 M	10.29 M	0.0 M
NORMAL BALLAST	8.37 M	5.40 M	2.97 M

ENGINE ORDER	RPM	SPEED LOADED	SPEED BALLAST
MAX. SEA AHEAD	79.7	21.2 KNOTS	22.1 KNOTS
FULL AHEAD	55	14.3 KNOTS	14.8 KNOTS
HALF AHEAD	45	11.6 KNOTS	12.1 KNOTS
SLOW AHEAD	30	7.5 KNOTS	8.1 KNOTS
DEAD SLOW AHEAD	25	6.2 KNOTS	6.7 KNOTS
DEAD SLOW ASTERN	− 25		
SLOW ASTERN	− 30		
HALF ASTERN	− 45		
FULL ASTERN	− 55		

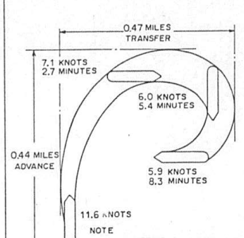
TURNING CIRCLE DIAGRAMS

NOTE: THERE IS NO APPRECIABLE DIFFERENCE IN THE TIME, OR DISTANCE OF ADVANCE AND TRANSFER WHEN MAKING A TURN TO PORT OR STARBOARD THEREFORE, ALL DIAGRAMS SHOW A STARBOARD TURN AND THE SAME INFORMATION WOULD APPLY WHEN MAKING A TURN TO PORT

NORMAL LOADED CONDITION — MAX. SEA SPEED (79.7PRM)

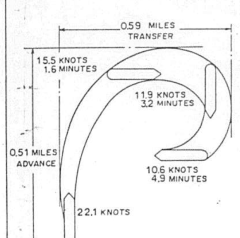


NORMAL LOADED CONDITION — HALF SPEED (45 RPM)

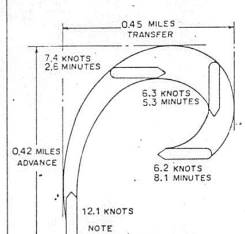


NOTE
AT SLOW SPEED TRANSFER AND ADVANCE ABOUT SAME AS HALF SPEED, BUT SPEEDS PROPORTIONALLY LESS AND TIMES PROPORTIONALLY GREATER.

NORMAL BALLAST CONDITION — MAX. SEA SPEED (79.7 RPM)



NORMAL BALLAST CONDITION — HALF SPEED (45 RPM)



NOTE
AT SLOW SPEED TRANSFER AND ADVANCE ABOUT SAME AS HALF SPEED, BUT SPEEDS PROPORTIONALLY LESS AND TIMES PROPORTIONALLY GREATER.

THIS FORM IS DESIGNED TO COMPLY WITH CFR 33 PARA 164.35.

MITSUI ENGINEERING & SHIPBUILDING CO., LTD. TAMANO WORKS

1003

1/6

APPROVAL OF OWNER & REGULATORY BODIES

ALT.NO.	OWNER DATE	OWNER LETTER NO.	USCG DATE	USCG LETTER NO.	ABS DATE	ABS LETTER NO.	USPH DATE	USPH LETTER NO.
ORIGINAL	16~23 JAN.'85	DISCUSSION MEMO. AT TAMANO			4 JUNE '85	ABS/Y-8-2		

FINISHEDPLAN

SHIPYARD AND SHIP'S NO. & NAME

MITSUI TAMANO		MITSUBISHI KOBE	
NO.1323	DOCTOR LYKES	NO.1158	JAMES LYKES
NO.1324	ALMERIA LYKES	NO.1159	JOSEPH LYKES
NO.1325	TILLIE LYKES	NO.1164	SOLON TURMAN

MITSUI ENGINEERING & SHIPBUILDING CO.,LTD.
TAMANO WORKS

SHIP DESIGN DEPARTMENT MANAGER

SHIP'S NO. **NO.1325** SHIP'S NAME **TILLIE LYKES**

OUTFITTING DESIGN SECTION

艤装数

EQUIPMENT NUMBER
CLASS(ABS)

DATE
JOB NO. TS1323/24/25
SCALE
LYKES REF. NO. 260001
MITSUI DRAWING NO. 4102001

(6 SHEETS WITH COVER)

PLAN RECORD

ALT.NO.	MARK	ALTERATION/DESCRIPTION	DATE & SIGNATURE
1		PREPARED FOR S.NO.1323 AS FINSHED PLAN, MADE APPLICABLE TO S.NO.1324 AND S.NO.1325.	NOVEMBER.20.'86

DWG.NO. 4102001

1004

4/6

Calculation of Equipment Number

$N = \Delta^{2/3} + 2\,Bh + 0.1\,A$

Where:

Length (~~l.p.p.~~ 97% lwl)	= L =	243.00	m
Breadth (mld)	= B =	32.20	m
Depth (")	= D =	18.80	m
Draft (")	= d =	11.88	m
Δ = MOLDED DISPLACEMENT TO THE SUMMER LOAD WATER LINE		61,823	K.T.(mld.)
$\Delta^{2/3}$ =		1,563.5	
h =		26.07	m

ⓐ = L × (D-d)	= 243.00 × 6.92	= 1681.56
ⓑ = lb × hb	= (3.05+3.55)/2 × 15.01	= 49.53
ⓒ = lc × hc	= 14.63 × 3.05	= 44.62
ⓓ = ld × hd	= 14.63 × 2.7	= 39.50
ⓔ = le × he	= 14.63 × 2.7	= 39.50
ⓕ = lf × hf	= 14.63 × 2.7	= 39.50
ⓖ = lg × hg	= 14.63 × 2.7	= 39.50
ⓗ = lh × hh	= 14.63 × 2.7	= 39.50
ⓘ = li × hi	= 12.49×2.6 + 0.4×1.6/2	= 32.79
ⓙ = lj × hj	= (1.5+3.05)/2 × 1.6	= 3.64
ⓚ = lk × hk	= 6.4 × 5.2	= 33.28
ⓛ = ll × hl	= 6.4 × 7.3	= 46.72
	A	= 2089.64

N = 1563.5 + 2 × 32.2 × 26.07 + 0.1 × 2089.64

= 1563.5 + 1678.9 + 208.96

= 3451.36

3400 < N = 3452 < 3600

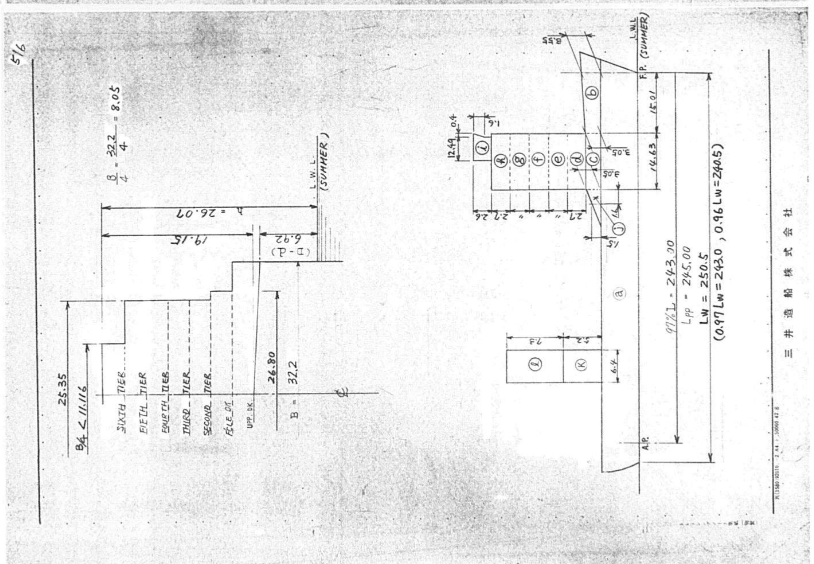
3/6

GENERAL NOTE

1. THOUGH SPEC PAGE D2-4 REQUIRES MOORING ROPE TO BE 6×37, IWRC WE PROPOSE TO ADOPT 6×WS(36) IWRC BECAUSE 6×37 IWRC CAN NOT BE FOUND IN THE MARKET

DWG.NO. 4102001

5/6



E Q U I P M E N T

EQUIPMENT LETTER: U42

ITEM	EQUIPMENT REQUIRED BY RULE	EQUIPMENT OF S.NO. 1323/24/25 1158/59/60
BOWER ANCHOR	STOCKLESS HIGH HOLDING POWER TYPE NUMBER; 3 WEIGHT PER ANCHOR; 10,500 kg x 0.75 = 7,875 kg	STOCKLESS CAST STEEL HIGH HOLDING POWER TYPE (AC-14) NUMBER; 3 WEIGHT PER ANCHOR; 7,875 kg
STUD LINK CHAIN CABLE	SPECIAL STEEL (GRADE 3) LENGTH; 660.0 m DIAMETER; 78 mm	MATERIAL; EXTRA SPECIAL STEEL (GRADE 3) LENGTH; 660.0m DIAMETER; 78 mm
TOW LINE	LENGTH; MIN. BREAKING STRENGTH;	LENGTH; DIAMETER; BREAKING STRENGTH;
MOORING ROPES	NUMBER; 6 LENGTH; 200 m MIN. BREAKING STRENGTH; 60,000 kg	MATERIAL; GALV. FLEX. STEEL WIRE 6×WS(36) IWRC NUMBER; 6 LENGTH; 200 m DIAMETER; 33.5 mm BREAKING STRENGTH; 65,000 kg

9/9

1005

APPROVAL OF OWNER & REGULATORY BODIES

ALT. NO.	OWNER DATE	OWNER LETTER NO.	USCG DATE	USCG LETTER NO.	ABS DATE	ABS LETTER NO.	USPH DATE	USPH LETTER NO.
ORIGINAL	20 FEB. '85	OFTS/MES/104			10 APRIL '85	T-8-2		
△1	22 APRIL '85	OFTS/MES 322			23 MAY '85	T-8-2		
△2	8 AUG. '85	OFTS/MES 836			4 OCT '85	T-8-2		
△3	—	—			—	—		

FINISHEDPLAN

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SHIPYARD AND SHIP'S NO. & NAME			
MITSUI TAMANO		MITSUBISHI KOBE	
NO.1323	DOCTOR LYKES	NO.1158	JAMES LYKES
NO.1324	ALMERIA LYKES	NO.1159	JOSEPH LYKES
NO.1325	TILLIE LYKES	NO.1164	SOLON TURMAN

MITSUI ENGINEERING & SHIPBUILDING CO., LTD.
TAMANO WORKS

SHIP DESIGN DEPARTMENT MANAGER — SHIP'S NO. — SHIP'S NAME: TILLIE LYKES

OUTFIT. DESIGN SEC.(PIPING) SEC.CHIEF

甲板機械駆動用油圧管系統図
DIAGRAM OF HYD. OIL PIPE
FOR DECK MACHINERY

DATE (TEL 2240) NOV. 10.1986

JOB NO. TS1323/24/25 — SCALE ~ — LYKES REF. NO. 260102 — MITSUI DRAWING NO. 4101401
JOBCLASSIF. NO. D.01.04

(27 SHEETS WITH COVER)

1/27

PLAN RECORD

ALT. NO.	MARK	ALTERATION/DESCRIPTION	DATE & SIGNATURE
		PREPARED FOR S.1323 AS FINISHED PLAN, MADE APPLICABLE TO S.1324 AND S.1325.	JUNE 30, '86

DWG. NO. 4101401 — 2/27

GENERAL NOTE

1. WORKING & TEST PRESSURE (SUPPLY LINE)
   - WORK. PRESSURE ------ {PU-1, 4, 5&6 --- 38; PU-2&3 --- 38.6} kg/cm²
   - SET PRESSURE OF SAFETY VALVE ---- 45 kg/cm²
   - AFTER FABRICATION HYD. TEST ----- 68 kg/cm²
   - AFTER INSTALLATION IN THE VESSEL HYD. TEST --- 68 kg/cm²
2. NECESSARY EXPANSION BENDS TO BE PROVIDED ON ACTUAL INSTALLATION.
3. FLUSHING TO BE CARRIED OUT FOR ALL HYD. OIL PIPES.

DWG. NO. 4101401 — 3/27

REFERENCE

NO.	REF. NO. MES	REF. NO. LIKES	DWG. NO.	DWG. NAME
1	D-49	480001	4116002	PIPING PRACTICE
2	D-50	190102	4116003	PIPE COLOUR IDENTIFICATION SCHEDULE
3	D-51	482601	4116004	COMPARISON TABLE OF ASTM & JIS MATERIAL FOR PIPE JOINTS
4	D-52	482602	4116005	SPECIFICATION OF NON STANDARD PIPE JOINTS FOR STEEL PIPE
5	D-53	482603	4116006	SPECIFICATION AND COMPARISION TABLE (JIS/ASTM) OF BOLTS & NUTS.
6	D-54	482604	4116007	SPECIFICATION OF NON STANDARD PIPE JOINTS FOR COPPER PIPES
7		482605	5131201	FABRICATION METHOD FOR PIPING (WELDING, BRAZING PROCEDURE)
8		482606	5131202	COMPARISON TABLE OF JIS & ASTM MATERIAL FOR PIPE (HULL & MACHINERY PART)
9		482607	5131203	CALCULATION SHEET OF PIPE WALL THICKNESS FOR PIPING SYSTEM (GENERAL PIPING)
10		482608	5131205	GASKET (GENERAL USE)
11	D-1	260101	4101110	DECK MACHINERY
12	D-55	480302	4116101	DIAGRAM OF FIRE & WASH DECK LINE
13		482404	5233111	MARINE CAST STEEL VALVE
14		482407	5233114	MARINE BRONZE VALVE
15	D-106	480602	4116601	DIAGRAM OF FRESH, HOT, POTABLE WATER SEA WATER & STEAM PIPE FOR ACCOMM. USE
16		480601	5131018	COOLING S.W. & S.W. SERVICE PIPING DIAGRAM IN ENGINE ROOM
17				
18				
19				
20				

DWG. NO. 4101401 — 4/27

1006

PIPING LIST (2/4)

SYSTEM (SERVICE)		MAX. WORK. PRESS	WORK. TEMP.	HYD. TEST PRESS	PIPE MATERIAL		LIST NO. STANDARD	ACT. END	NOM. DIA. MM	NOM. DIA. INCH	OUT. DIA. (MM)	THICK (MM)	SCH. NO.	PRESS STD.	JOINT (SEE REF. 4-6) TYPE	JOINT MATERIAL	USCG PIPING CLASS	AB PIPING CLASS
HYD. OIL RETURN LINE (ON EXPOSED DK.)	SYSTEM OIL	3	50	–	STAINLESS STEEL PIPE JIS G 3459 SUS 304 TP (EQUIVALENT TO ASTM A312 Gr. TP304)		MR-21-40	24	125	5	139.8	6.6	40	10K	BUTT WELDED JOINT OR STAINLESS STEEL SLIP-ON WELD. FLANGE	BUTT WELDED JOINT: STAINLESS STEEL JIS G 3459 SUS 304 (EQUIV. TO ASTM A312 Gr. TP304) OR STAINLESS STEEL SLIP-ON FLANGE & SOCKET WELD. JOINT: STAINLESS STEEL JIS G 3214 SUS F304 (EQUIV. TO ASTM A182 Gr. F304)	II	II
							- -											
							- -											
							- -											
							- -											
							- -											
							- -											
							- -											
							- -											
		1					MR-81-100	82	65	2½	76.3	5.2	40		BUTT WELDED JOINT OR STAINLESS STEEL SLIP-ON WELD. FLANGE OR SOCKET WELD. JOINT			
							MR-121-140	124	40	1½	48.6	3.7	40					
							- -											
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							- -											
							- -											
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DWG. NO. 410101 6/27

PIPING LIST (4/4)

SYSTEM (SERVICE)		MAX. WORK. PRESS	WORK. TEMP.	HYD. TEST PRESS	PIPE MATERIAL		LIST NO. STANDARD	ACT. END	NOM. DIA. MM	NOM. DIA. INCH	OUT. DIA. (MM)	THICK (MM)	SCH. NO.	PRESS STD.	JOINT (SEE REF. 4-6) TYPE	JOINT MATERIAL	USCG PIPING CLASS	AB PIPING CLASS
COOLING SEA WATER LINE	SEA WATER	6	32	–	COPPER NICKEL PIPE (90-10) ASTM B466 Gr. C 70600 ANNEALED		MC-1-20	5	65	2½	66.75	1.62	–	10K	Cu-Ni BRAZED JOINT OR COMPOSITE FLANGE	Cu-Ni BRAZED JOINT: ASTM B466 Gr. C 70600 ANNEALED OR COMPOSITE FLANGE: JIS H 5114 AL BC2 (EQUIV. TO ASTM B148) & JIS G 3101 SS41 (EQUIV. TO ASTM A36)	II	II
							- -											
							- -											
							- -											
							- -											
							- -											
							- -											
							- -											
							MC-21-40	32	40	1½	40.95	1.92	–		Cu-Ni BRAZED JOINT OR BRASS SLIP-ON BRAZED FLANGE	Cu-Ni BRAZED JOINT: ASTM B466 Gr. C 70600 ANNEALED OR BRASS SLIP-ON BRAZED FLANGE: JIS H 5111 BC7 (EQUIV. TO ASTM B61)		
							- -											
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							- -											
							- -											
					SEAMLESS STEEL PIPE JIS G 3455 STS 38-S (EQUIVALENT TO ASTM A106 Gr. A)	GALVANIZED	MC-101-120	102	65	2½	89.1	12.0	160		STEEL SLIP-ON WELD. FLANGE	JIS G 3101 SS41 (EQUIV. TO ASTM A36)		
							- -											
							- -											
							- -											
							- -											

DWG. NO. 410101 8/27

STEEL PIPE --- Y/a 4201491
STAINLESS STEEL PIPE --- Y/a 4201492
COPPER NICKEL PIPE --- Y/a 4201493
STEEL FLG. --- Y/a 4201460
SUS. FLG. --- Y/a 4201461
Cu/Ni FLG. --- Y/a 4201463
BUTT WELD JOINT --- Y/a 4201462
SUS BUTT WELD J. --- Y/a 4201464
Cu/Ni PIPE JOINT --- Y/a 4201465

PIPING LIST (1/4)

SYSTEM (SERVICE)		MAX. WORK. PRESS	WORK. TEMP.	HYD. TEST PRESS	PIPE MATERIAL		LIST NO. STANDARD	ACT. END	NOM. DIA. MM	NOM. DIA. INCH	OUT. DIA. (MM)	THICK (MM)	SCH. NO.	PRESS STD.	JOINT (SEE REF. 4-6) TYPE	JOINT MATERIAL	USCG PIPING CLASS	AB PIPING CLASS
HYD. OIL SUPPLY LINE (ON EXPOSED DK.)	SYSTEM OIL	45	50	68	STAINLESS STEEL PIPE JIS G 3459 SUS 304 TP (EQUIVALENT TO ASTM A312 Gr. TP304)		MS-21-40	28	125	5	139.8	6.6	40	40K	BUTT WELDED JOINT OR STAINLESS STEEL WELDING NECK FLANGE	BUTT WELDED JOINT: STAINLESS STEEL JIS G 3459 SUS 304 (EQUIV. TO ASTM A312 Gr. TP304) OR STAINLESS STEEL WELDING NECK FLANGE & SOCKET WELD. JOINT: STAINLESS STEEL JIS G 3214 SUS F304 (EQUIV. TO ASTM A182 Gr. F304)	I	I
							- -											
							- -											
							- -											
							- -											
							- -											
							- -											
							- -								SOCKET WELD. JOINT OR STEEL SOCKET WELD. FLANGE			
							MS-161-180	164	15	½	21.7	2.8	40					
							- -											
HYD. OIL SUPPLY LINE (IN INTERIOR SP.)					SEAMLESS STEEL PIPE AB Gr. 4		MS-221-240	232	125	5	139.8	6.6	40		BUTT WELDED JOINT OR STEEL WELDING NECK FLANGE	BUTT WELDED JOINT: STEEL JIS G 3456 STPT42 (EQUIV. TO ASTM A106 Gr. B) OR STEEL WELD. NECK/SLIP-ON FLANGE & SOCKET WELD. JOINT: STEEL JIS G 3201 SF50A (EQUIV. TO ASTM A105)		
							MS-281-300	282	65	2½	76.3	5.2	40					
							- -											
							- -											
							- -											
							- -											
							- -								SOCKET WELD. JOINT OR STEEL SOCKET WELD. FLANGE			
							- -											
							MS-361-380	368	15	½	21.7	2.8	40					

AS PER ABS COMMENT (FEB. 11, 1985)

DWG. NO. 410101 5/27

PIPING LIST (3/4)

SYSTEM (SERVICE)		MAX. WORK. PRESS	WORK. TEMP.	HYD. TEST PRESS	PIPE MATERIAL		LIST NO. STANDARD	ACT. END	NOM. DIA. MM	NOM. DIA. INCH	OUT. DIA. (MM)	THICK (MM)	SCH. NO.	PRESS STD.	JOINT (SEE REF. 4-6) TYPE	JOINT MATERIAL	USCG PIPING CLASS	AB PIPING CLASS
HYD. OIL RETURN LINE (IN INTERIOR SP.)	SYSTEM OIL	3	50	–	WELDED STEEL PIPE JIS G 3454 STPG 38-E (EQUIVALENT TO ASTM A53 Gr. A-E)		MR-221-240	228	125	5	139.8	6.6	40	10K	BUTT WELDED JOINT OR STEEL SLIP-ON WELD. FLANGE	BUTT WELDED JOINT: STEEL JIS G 3456 STPT 42 (EQUIV. TO ASTM A106 Gr. B) OR STEEL SLIP-ON WELD. FLANGE: STEEL JIS G 3101 SS41 (EQUIV. TO ASTM A36) OR SOCKET WELD. JOINT: STEEL JIS G 3201 SF50A (EQUIV. TO ASTM A105)	II	II
							- -											
							- -											
							- -											
							- -											
							- -											
							- -											
							- -											
							- -											
		1					MR-281-300	288	65	2½	76.3	5.2	40		BUTT WELDED JOINT OR STEEL SLIP-ON WELD. FLANGE OR SOCKET WELD. JOINT			
							MR-321-340	324	40	1½	48.6	3.7	40					
AIR PIPE FOR FILL. TANK (IN INTERIOR SP.)						GALV.	MR-301-320	302	50	2	60.5	5.5	80					
							MR-351-360	352	20	¾	27.2	3.9	80					
							- -											
							- -											
AIR PIPE FOR FILL. TANK (ON EXPOSED DK.)							MR-101-120	102	65	2½	76.3	7.0	80					
							- -											
							- -											
							- -											

DWG. NO. 410101 7/27

1007

FITTING LIST (2/2)

SYMBOL	TYPE	SERVICE	PRESS. RATE (kg/cm²)	MAX. WORK. PRESS. (kg/cm²)	WORK. TEMP. (°C)	MATERIAL BODY	MATERIAL STEM	MATERIAL DISC	NOM. DIA. MM	NOM. DIA. INCH	QTY.	LIST NO.	REMARKS
	DISC FLOAT TYPE AIR PIPE HEAD WITH WIRE NET SCREEN	SYSTEM OIL	10	1	38	DUCTILE CAST IRON FCD 45 JIS G 5502 (EQUIV. TO ASTM A 395 65-45)	—	—	65	2 1/2	2	MRV-10-1~2	%4 4201419
	BLANK FLANGE					STAINLESS STEEL JIS G 3214 SUS F304 (EQUIV. TO ASTM A182 Gr. F304)	—	—	40	1 1/2	2	MRV-11-1~2	%4 4201461
	SELF CLOSING VALVE FOR OIL LEVEL GAUGE		5		50	CAST BRONZE BC 6 JIS H 5111 (EQUIV. TO ASTM B62)	STENLESS STEEL SUS 304 JIS G 4303 (EQUIV. TO ASTM A276 TYPE 304)	CAST BRONZE BC6 JIS H5111 (EQUIV. TO ASTM B62)	20	3/4	2	MRV-20-1~2	%

DWG NO. 4101401

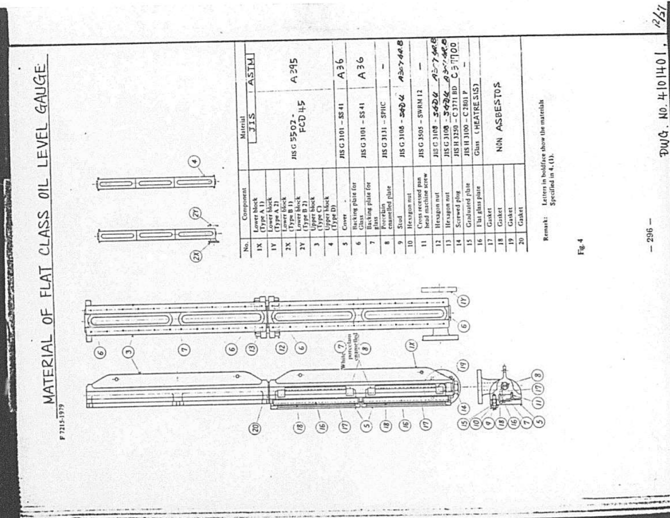
2/27

FITTING LIST (1/2)

SYMBOL	TYPE	SERVICE	PRESS. RATE (kg/cm²)	MAX. WORK. PRESS. (kg/cm²)	WORK. TEMP. (°C)	MATERIAL BODY	MATERIAL STEM	MATERIAL DISC	NOM. DIA. MM	NOM. DIA. INCH	QTY.	LIST NO.	REMARKS
	GLOBE VALVE	SEA WATER	10	6	32	CAST STEEL SC49 JIS G 5101 (EQUIV. TO ASTM A216 Gr. WCB) EPOXY COAT	STAINLESS STEEL SUS 304 JIS G 4303 (EQUIV. TO ASTM A276 TYPE 304)	ALUMINIUM BRONZE CASTING ALBC2 JIS H 5114 (EQUIV. TO ASTM B148 C95400)	65	2 1/2	2	MCV-1-1~2	SEE REF. NO. 13 %4 4201410
			16			CAST BRONZE BC6 JIS H5111 (EQUIV. TO ASTM B62)	STAINLESS STEEL SUS 304 JIS G 4303 (EQUIV. TO ASTM A276 TYPE 304)	CAST BRONZE BC6 JIS H5111 (EQUIV. TO ASTM B62)	40	1 1/2	6	MCV-2-1~6	SEE REF. NO. 14 %4 4201418
		SYSTEM OIL	10.5	3	50	REFER TO OTHER DWG. (REF. NO. 11)			40	1 1/2	2	MRV-1-1~2	SEE REF. NO. 11
	CHANGE OVER VALVE		45	45					100	4	4	MSV-1-1~4	
									125	5	2	MSV-2-1~2	
	FILLING PUMP		5	1					40	1 1/2	2	MRV-7-1~2	
	SIGHT GLASS		1.5						40	1 1/2	2	MRV-14	
	FLAT CLASS OIL LEVEL GAUGE		5			JIS G 5502 FCD 45 (EQUIV. TO ASTM A395)	—	—	-	-	2	MRV-3.	SEE PAGE 10/26 & 11/27 %4 4201413
											1	MRV-12	
											1	MRV-13	
	SELF CLOSING VALVE FOR OIL LEVEL GAUGE					CAST BRONZE BC6 JIS H5111 (EQUIV. TO ASTM B62)	STAINLESS STEEL SUS 304 JIS G 4303 (EQUIV. TO ASTM A276 TYPE 304)	CAST BRONZE BC6 JIS H5111 (EQUIV. TO ASTM B62)	-	-	3	MRV-5-1~3	SEE REF. NO. 14 %4 4201418
											1	MRV-6	
	SCREW DOWN STOP CHECK GLOBE VALVE	SEA WATER	10	6	32	CAST STEEL SC 49 JIS G 5101 (EQUIV. TO ASTM A216 Gr. WCB) EPOXY COAT	STAINLESS STEEL SUS 304 JIS G 4303 (EQUIV. TO ASTM A276 TYPE 304)	ALUMINIUM BRONZE CASTING ALBC2 JIS H 5114 (EQUIV. TO ASTM B148 C95400)	65	2 1/2	2	MCV-3-1~2	SEE REF. NO. 13 %4 4201410 (WITH OPEN/SHUT INDICATOR)
									65	2 1/2	1	MCV-4	SEE REF. NO. 13 %4 4201410

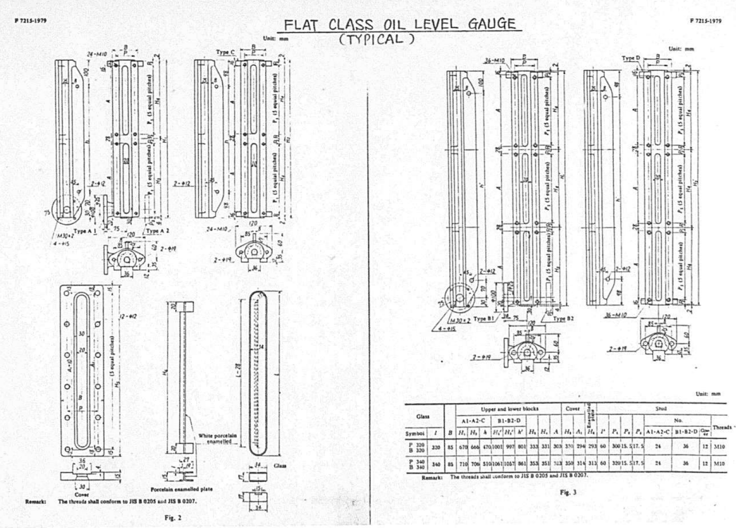
DWG NO. 4101401

1/26



DWG. NO. 4101401.

11/27



DWG. NO. 4101401

10/26

1008

1. INSTRUCTION OF PIPING SYSTEM DESIGN

1-1. MAIN LINE

(1) Piping should rise gradually from hydraulic pump to hydraulic motor. Avoid downward portions of the piping after rising as far as possible. In an unavoidable case, use the plug at the convex point.

(2) In case of long horizontal piping, fit the air plug at the place where the air gathers easily.

(3) It is desirable to have the least possible pipe bends. Any sharp bend must be avoided.

(4) Fit the drain plug at the suitable place.

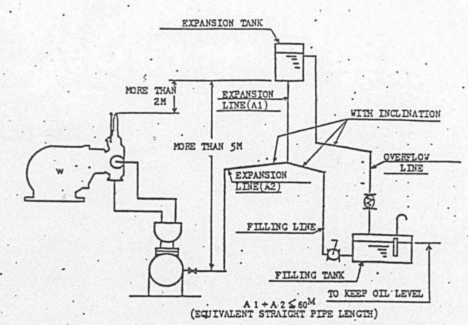
(5) Going and returning pipe length of main pipe is usually to be less than 100M.
When main pipe is longer than this length, diameter of pipe should be increased.

1-2 EXPANSION TANK LINE

(1) The height of expansion tank should be more than 2M above the highest part of hydraulic equipment(usually top of control valve) and over 5M away from where the expansion pipe is fitted to the pump.

(2) Horizontal line of expansion pipe should be short and number of bends should be few. Total equivalent straight length from expansion tank to pump fitting inlet should be within 60M.
If the length exceeds this valve, it is necessary to increase the pipe diameter.

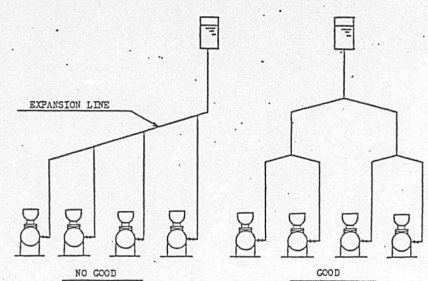
(3) Lead the pipe of expansion line to tank rising from the installing part of hydraulic pump.
Avoid the design such as the pipe goes down to the middle of the piping. Similar caution is necessary for both the overflow line and the filling line.



$A1 + A2 \leq 60^M$
(EQUIVALENT STRAIGHT PIPE LENGTH)

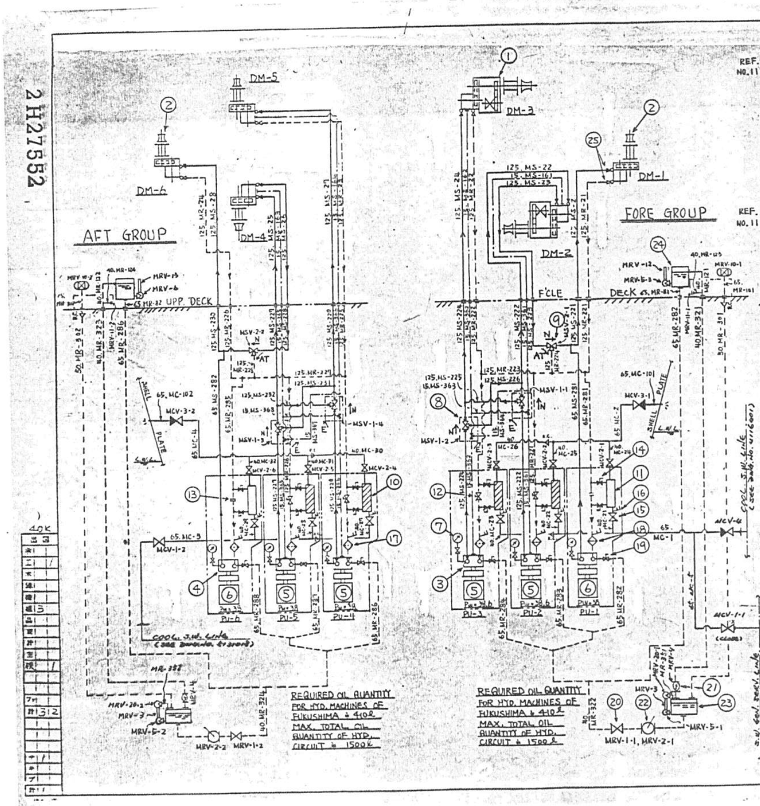
When the work oil of expansion tank is full, keep the oil of filling tank to be about one third.

(4) When connecting more than two pump, connect as the picture below.



We recommend you to design it taking the above cautions into condition.

1009



支給区分	番号	名称	所要数	型式	要目	図面番号	備考
Ⓟ	1	HYD. WINDLASS	2			H04242	
Ⓟ	2	HYD. AUTO-TENSION WINCH	4	W320-5'	20T×15M/min (2L)	2H27533 2H27534	
Ⓟ	3	HYD. PUMP WITH REDUCTION GEAR	4		280KG	2H27535	WITH PLANETARY REDUCTION GEAR
Ⓟ	4	Do.	2	FG3/E22	450KG	2H27556	Do.
	5	ELECTRIC MOTOR	4		95KW×1800RPM		RATING 30MIN
	6	Do.	2		20KW×1800RPM		RATING CONT.
Ⓟ	7	PRESSURE GAUGE WITH VALVE	6	JIS		H404082	
Ⓟ	8	CHANGE OVER VALVE	4	F49	φ100	H401204	
Ⓟ	9	Do.	2	FF40-125	φ125	H303003	
Ⓟ	10	OIL COOLER	4	0-F3-125A	COOLING SURFACE 3.5M²	H303022A	COOLING WATER Q≒150ℓ/min
Ⓟ	11	Do.	2	0-F2-65AP	COOLING SURFACE 1.9M²	H303022A	Do.
Ⓟ	12	BUTTERFLY VALVE	4		φ125	H301381A	FOR COOLER
Ⓟ	13	ORIFICE PLATE	2				Do.
Ⓟ	14	BUTTERFLY VALVE	12		φ50	H301381A	Do.
Ⓟ	15	GLOBE VALVE	6		10.5K-φ40	4H17127	Do.
Ⓟ	16	THERMOMETER	12		-20°C ~ +100°C	H-388	
Ⓟ	17	FULL FLOW FILTER	4	N7	φ125	H301403	
Ⓟ	18	Do.	2	N8	φ100	3H31399	
Ⓟ	19	BUTTERFLY VALVE	6		φ65	H301381A	
Ⓟ	20	GLOBE VALVE	2		φ40	H401505/1	
Ⓟ	21	SIGHT GLASS	2		φ40	H300013	
Ⓟ	22	FILLING PUMP	2		φ40	H304395	
	23	FILLING TANK	2		200ℓ		MATERIAL JIS G 3101 SS41 (EQUIV. TO ASTM A36)
	24	EXPANSION TANK	2		200ℓ		
	25	REDUCER	32		100A×125A		MATERIAL JIS G 3452 STPT42 (EQUIV. TO ASTM A106 Gr.B)

REF. NO. 11

- WORKING PRESSURE = Pw kg/cm²
- SAFETY VALVE SET PRESSURE = 45kg/cm²
- ⑧⑨ CHANGE OVER VALVE

N: NORMAL FLOW
E: EMERGENCY FLOW
AT: AUTO-TENSION FLOW

NOTE
1. Ⓟ THIS MARK TO BE SUPPLIED BY FUKUSHIMA LTD.
2. QUANTITY SHOWS FOR 1 VESSEL.
3. ENTERED VALUE OF PIPING SHOW NOMINAL SIZE.
   ═══ PRESSURE SIDE (40kg/cm²)
   ---- NONPRESSURE SIDE
4. CAUTION OF DESIGN AND CONSTRUCTION OF THE PIPING SHOULD CONFORM TO PROCEDURE MANUAL.
5. THE CAPACITY OF OIL TANK IS SUBJECTED TO CHANGE CONSIDERING THE TOTAL OIL QUANTITY OF PIPING.
6. SHIPYARD SHOULD BE SUBMIT 4 SHEETS OF PIPE DIAGRAM TO FUKUSHIMA LTD. AND OUR DECISION WILL BE DESPATCHED AFTER RECEIVING SHIPYARD'S CONFIRMATION.

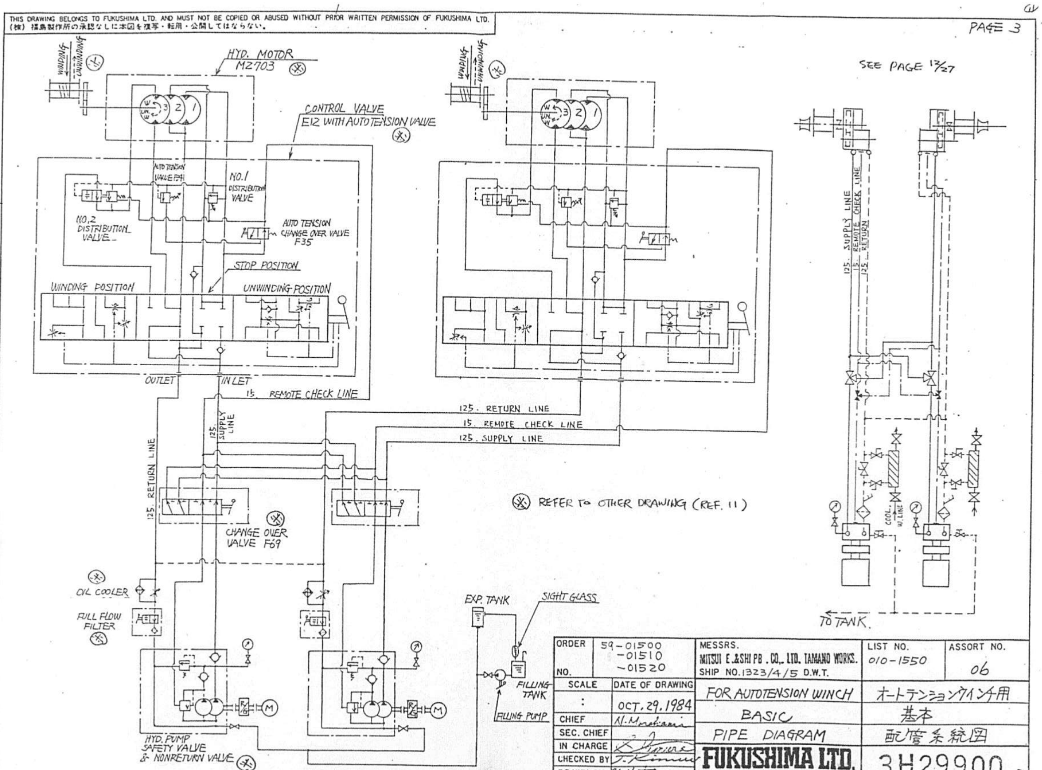
ORDER NO.	59-01500 -01510 -01520	MESSRS MITSUI E. & SHIPB. CO., LTD. TAMANO WORKS. SHIP NO. 1323/4/50 W.T	LIST NO. 010-1550	ASSORT NO. 06
SHIP CLASS	DATE OF DRAWING	2500TEU CONTAINER	2500個積 コンテナ船	
ABS/USCG	OCT. 19. 1984	HYDRAULIC DECK MACHINERY	油圧式甲板機械	
CHIEF		PIPE DIAGRAM	配管系統図	
SEC. CHIEF		FUKUSHIMA LTD. FUKUSHIMA JAPAN	2H27552	
IN CHARGE				
CHECKED BY				
DRAWN BY				

DWG. 410140

1010

3H29900

PAGE 3



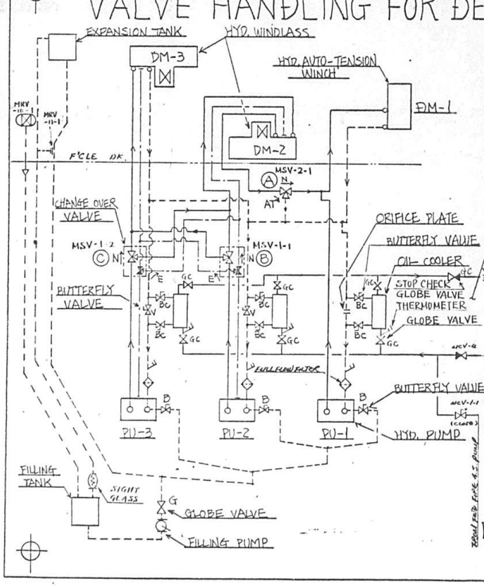
ORDER	59-01500 -01510 -01520	MESSRS. MITSUI E.&SHIPB. CO., LTD. TAMANO WORKS. SHIP NO. 1323/4/5 D.W.T.	LIST NO. 010-1550	ASSORT NO. 06
SCALE	DATE OF DRAWING OCT. 29. 1984	FOR AUTOTENSION WINCH	オートテンションウインチ用	
CHIEF		BASIC	基本	
SEC. CHIEF		PIPE DIAGRAM	配管系統図	
IN CHARGE / CHECKED BY / DRAWN BY		FUKUSHIMA LTD. FUKUSHIMA JAPAN	3H29900	

DWG. NO. 4101401

3H32541

図面来歴

VALVE HANDLING FOR DECK MACHINERY



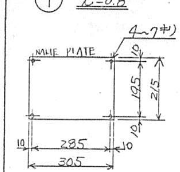
USE		HANDLING PARTS	PU-1	PU-2	PU-3	Ⓐ	Ⓑ	Ⓒ
NORMAL	ANCHORING & MOORING	DM-1		⊙		N	N	
		DM-2	O			N	N	
		DM-3			O			N
	AUTO-TENSION	DM-1	O			AT	N	
		DM-2		O			N	
		DM-3			O			N
EMERGENCY	ANCHORING & MOORING	DM-1			⊙	N	E	E
		DM-2			⊙	N		E
		DM-3		O			E	
	AUTO-TENSION	DM-2			O	AT		E
		DM-3		O			E	

O ---- WORKING N ---- NORMAL
E ---- EMERGENCY AT ---- AUTO-TENSION
C.O.V ---- CHANGE OVER VALVE
⊙ ---- EITHER WHICH, BUT NOT BOTH, CAN BE USED AT RATED LOAD AND SPEED AT ONE TIME.

NOTE
- BEFORE STARTING THE PUMP, OPEN THE GLOBE VALVE "G" AND FILL THE OIL IN THE EXPANSION TANK BY USING FILLING PUMP, AND THEN CLOSE THE GLOBE VALVE "G" AFTER ENSURING THE OVER FLOW BY SIGHT GLASS.
- ALWAYS BUTTERFLY VALVE "B", "V", "BC" AND FULL FLOW FILTER SHOULD BE OPENED AND GLOBE VALVE "G" CLOSED.
- CLOSE THE STOP SIDE OF CHANGE OVER VALVE FIRMLY.
- GLOBE VALVE "G" SHOULD BE OPENED ONLY WHEN USING FILLING PUMP.
- WHEN OIL TEMP. IS OVER +40°C, OIL COOLER SHOULD BE USED & ADJUST THE "V" VALVE ACCORDING TO OIL TEMP. & OPEN THE "GC" VALVE.

FUKUSHIMA LTD.
FUKUSHIMA JAPAN.

① t=0.8



MATERIAL OF NAME PLATE STAINLESS STEEL (SUS 304)

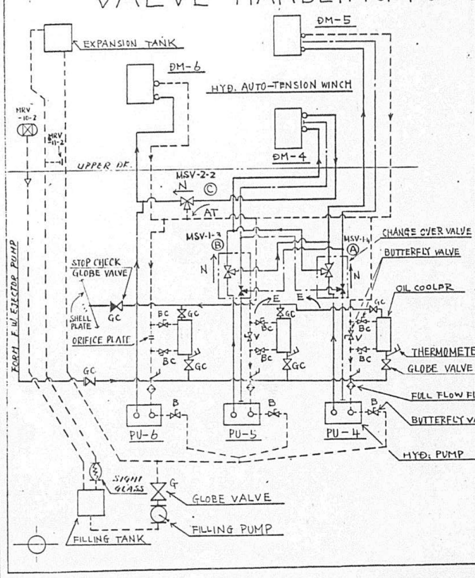
1. THE PANEL SHALL BE INSTALLED IN BOATSN'S STORE
2. CHANGE OVER VALVES TO BE LABELLED "A", "B" AND "C"

INSTRUCT. PANEL FOR VALVE HANDLING OF FORE GROUP

DWG. NO. 4101401 17/27

1011

VALVE HANDLING FOR DECK MACHINERY

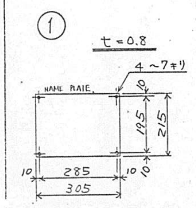


USE	HANDLING PARTS		PUMP PU-4	PUMP PU-5	PUMP PU-6	C.O.V Ⓐ	C.O.V Ⓑ	C.O.V Ⓒ
NORMAL	MOORING	DM-4		⊙			N	N
		DM-5	○			N		
		DM-6		⊙			N	N
	AUTO-TENSION	DM-4		⊙			N	AT
		DM-5	○			N		
		DM-6			○			AT
EMERGENCY	MOORING	DM-4	⊙			E		N
		DM-5		○			E	
		DM-6	⊙			E		N
	AUTO-TENSION	DM-4	○			E		AT
		DM-5		○			E	

○--- WORKING N--- NORMAL
E--- EMERGENCY AT--- AUTO-TENSION
C.O.V --- CHANGE OVER VALVE.
⊙--- EITHER WHICH, BUT NOT BOTH, CAN BE USED AT LATED LOAD AND SPEED AT ONE TIME.

NOTE
- BEFORE STARTING THE PUMP, OPEN THE GLOBE VALVE "G" AND FILL THE OIL IN THE EXPANSION TANK BY USING FILLING PUMP, AND THEN CLOSE THE GLOBE VALVE "G" AFTER ENSURING THE OVER FLOW BY SIGHT GLASS.
- ALWAYS BUTTERFLY VALVE "B", "V", "BC" AND FULL FLOW FILTER SHOULD BE OPENED AND GLOBE VALVE "G" CLOSED.
- CLOSE THE STOP SIDE OF CHANGE OVER VALVE FIRMLY.
- GLOBE VALVE "G" SHOULD BE OPENED ONLY WHEN USING FILLING PUMP.
- WHEN OIL TEMP. IS OVER +40°C, OIL COOLER SHOULD BE USED & ADJUST THE "V" VALVE ACCORDING TO OIL TEMP. & OPEN THE "GC" VALVE.

FUKUSHIMA LTD.
FUKUSHIMA JAPAN



MATERIAL OF NAME PLATE STAINLESS STEEL (SUS 304)

1. THE PANEL SHALL BE INSTALLED IN STEER. GEAR RM.
2. CHANGE OVER VALVES TO BE LABELLED "A" "B" AND "C"

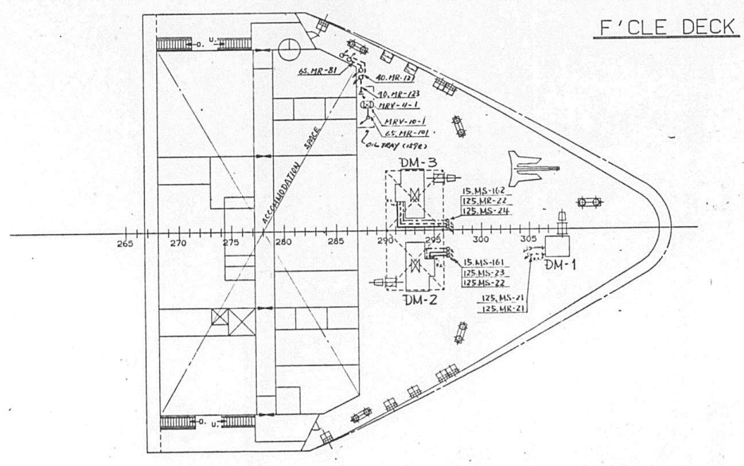
INSTRUCT. PANEL FOR VALVE HANDLING OF AFT GROUP

DWG. NO. 4101401, 18/37

図面来歴

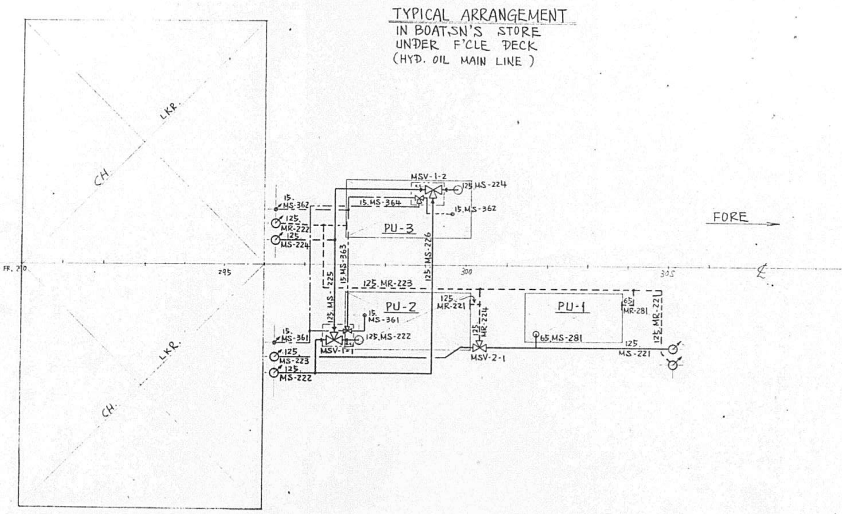
3H32542

F'CLE DECK



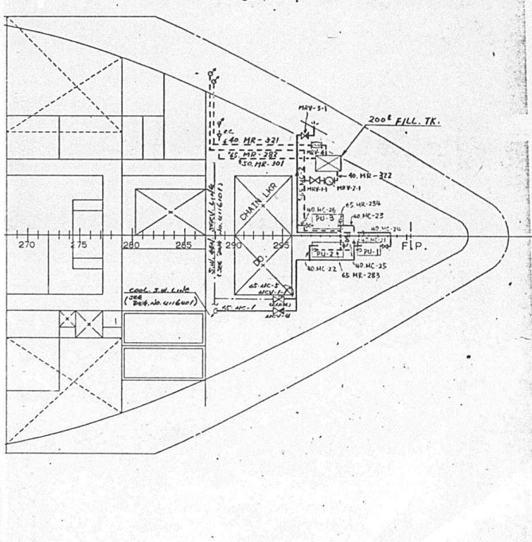
DWG. NO. 4101401, 19/37

1012

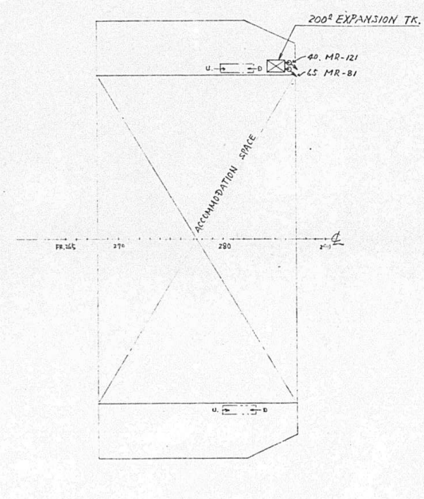


DWG. NO. 4101401 , 20/27

TYPICAL ARRANGEMENT
IN BOAT.SN'S STORE
ON UPPER DECK
(EXPANSION TANK FILL LINE & COOL. W. LINE)



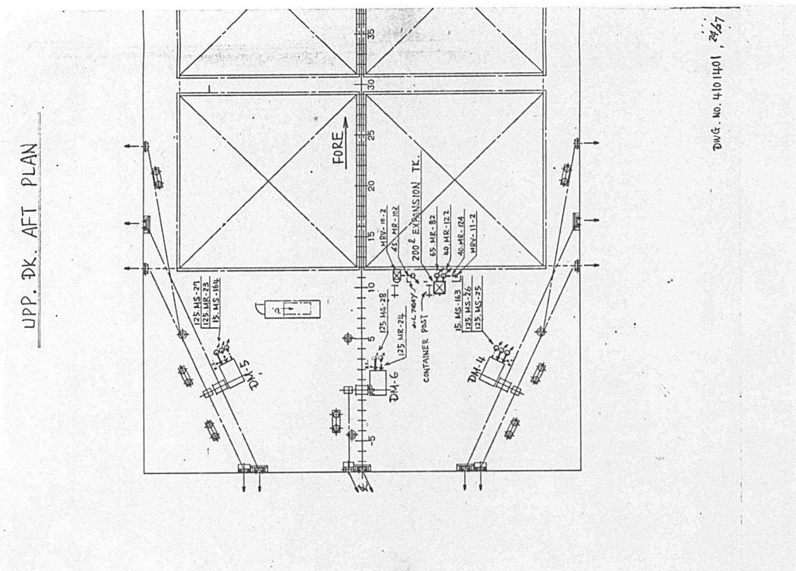
BOAT DECK

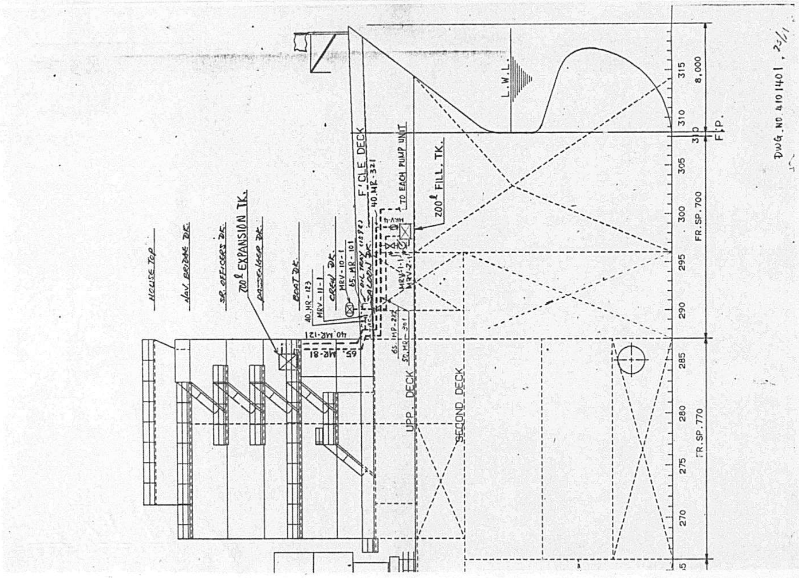


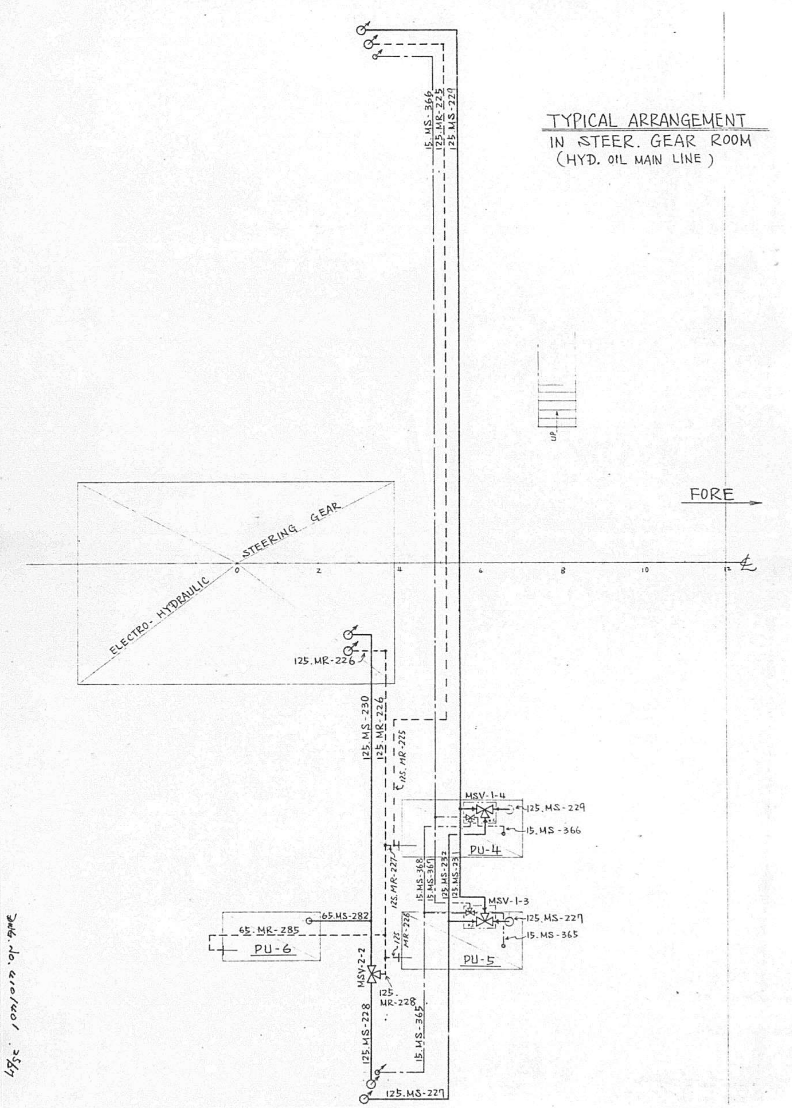
DWG NO. 4101401 , 21/27

DWG. NO. 4101401 . 22/27

1013

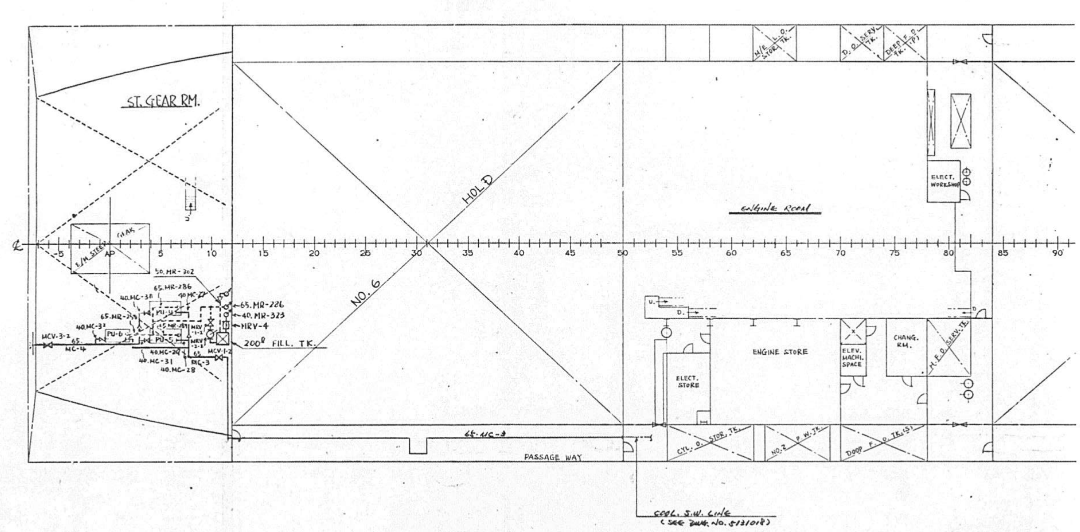

UPP. DK. AFT PLAN
FORE
200ℓ EXPANSION TK.
CONTAINER POST
DH-4
DH-5
DH-6
DWG. NO. 4101401


F'CLE DECK
200ℓ FILL. TK.
200ℓ EXPANSION TK.
UPP. DECK
SECOND DECK
L.W.L.
FR. SP. 700
FR. SP. 770
F.P.
DWG. NO. 4101401

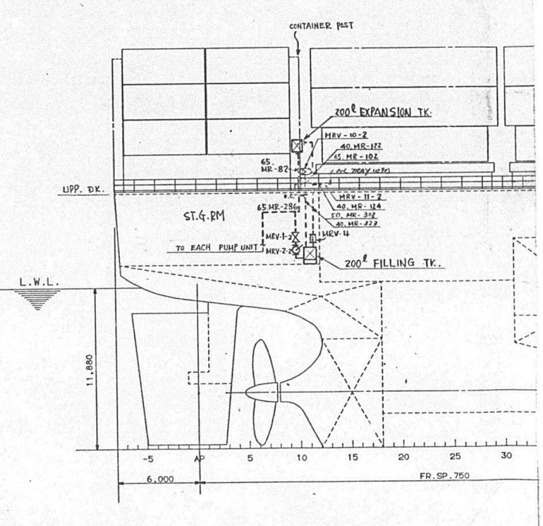

TYPICAL ARRANGEMENT
IN STEER. GEAR ROOM
(HYD. OIL MAIN LINE)
FORE
ELECTRO- HYDRAULIC STEERING GEAR
MSV-1-4
MSV-1-3
MSV-2-2
PU-4
PU-5
PU-6
125.MR-226
125.MS-229
15.MS-366
15.MS-365
65.MR-285
65.MS-282
125.MS-228
125.MS-227

1014

TYPICAL ARRANGEMENT
IN STEER. GEAR ROOM
(EXPANSION TANK LINE & COOL.W. LINE)



DWG. NO. 4101401 26/27



DWG NO. 4101401 , 2/2

1015

APPROVAL OF OWNER & REGULATORY BODIES

ALT. NO.	OWNER DATE	OWNER LETTER NO.	PANAMA DATE	PANAMA LETTER NO.	ABS (FOR REFERENCE) DATE	ABS LETTER NO.	USPH DATE	USPH LETTER NO.
ORIGINAL	3. MAY '85	OFTS/MES-380	11. MAY '85	–	27. JUNE '85	TT/54 7-P-2		
A	26. JUNE '85	OFTS/MES-782	15. JULY '85	–	–	–		
B	30. AUG. '85	OFTS/MES-912	6. SEP '85	–	–	–		

FINISHEDPLAN

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SHIPYARD AND SHIP'S NO. & NAME			
MITSUI TAMANO		MITSUBISHI KOBE	
NO.1323	DOCTOR LYKES	NO.1158	JAMES LYKES
NO.1324	ALMERIA LYKES	NO.1159	JOSEPH LYKES
NO.1325	TILLIE LYKES	NO.1164	SOLON TURMAN

MITSUI ENGINEERING & SHIPBUILDING CO.,LTD.
TAMANO WORKS

SHIP DESIGN DEPARTMENT MANAGER — SHIP'S NO. **NO.1325** — SHIP'S NAME **TILLIE LYKES**

OUTFITTING DESIGN SECTION

係船装置
MOORING ARRANGEMENT

Stamp: MITSUI ENGINEERING & SHIPBUILDING CO.,LTD. SHIP DESIGN DEPARTMENT — NOV. 10 1986

JOB NO. TS1323/24/25 — SCALE — LYKES REF. NO. 260103 — MITSUI DRAWING NO. 4102220

(20 SHEETS WITH COVER)

PLAN RECORD

ALT. NO.	MARK	ALTERATION/DESCRIPTION	DATE & SIGNATURE
1		PREPARED FOR S.NO. 1323 AS FINISHED PLAN, MADE APPLICABLE TO S.NO. 1324 AND S.NO. 1325.	NOVEMBER. 20. 86

DWG. NO. 4102220

GENERAL NOTE

1. PANAMA CHOCKS "M-42B/S" ARE POSITIONED AS SPECIFIED IN DISCUSSION MEMO "GENERAL, PAINTING AND HULL OUTFITTING" DATE 16~23 JAN. 1985 ITEM 11.
2. TYPE OF CHAIN CONTROLLER IS CHANGED TO ROLLER TONGUE TYPE INSTED OF A SLIDING TONGUE TYPE, WHICH WAS APPROVED BY OWNER AS SHOWN ON OUR DWG. NO 4102203 "CHAIN CONTROLLER".
3. ONE POINT MOORING CHOCK "M-30" IS PROVIDED ON PORT SIDE OF FO'CSLE DECK AS OWNER REQUESTED AT INITIAL DESIGN STAGE.
4. THE SPECIFICATION OF MOORING ROPE HAS BEEN CHANGED AS ALREADY APPROVED BY OWNER ON OUR DWG. NO. 4102001 "EQUIPMENT NUMBER".
5. TUG BITT (SPEC. PAGE D2-7). THE SIZE OF BITT IS CHANGED TO 250ᶲ INSTEAD OF 200ᶲ TO MEET PANAMA CANAL REGULATION.
6. ALL CHOCKS, BOLLARDS, DECK ROLLERS ETC. ARE TO BE LINED OFF AT SHIP TO THE SATISFACTION OF THE OWNER'S SUPERINTENDENTS BEFORE ANY SEATINGS ARE WELDED IN PLACE.

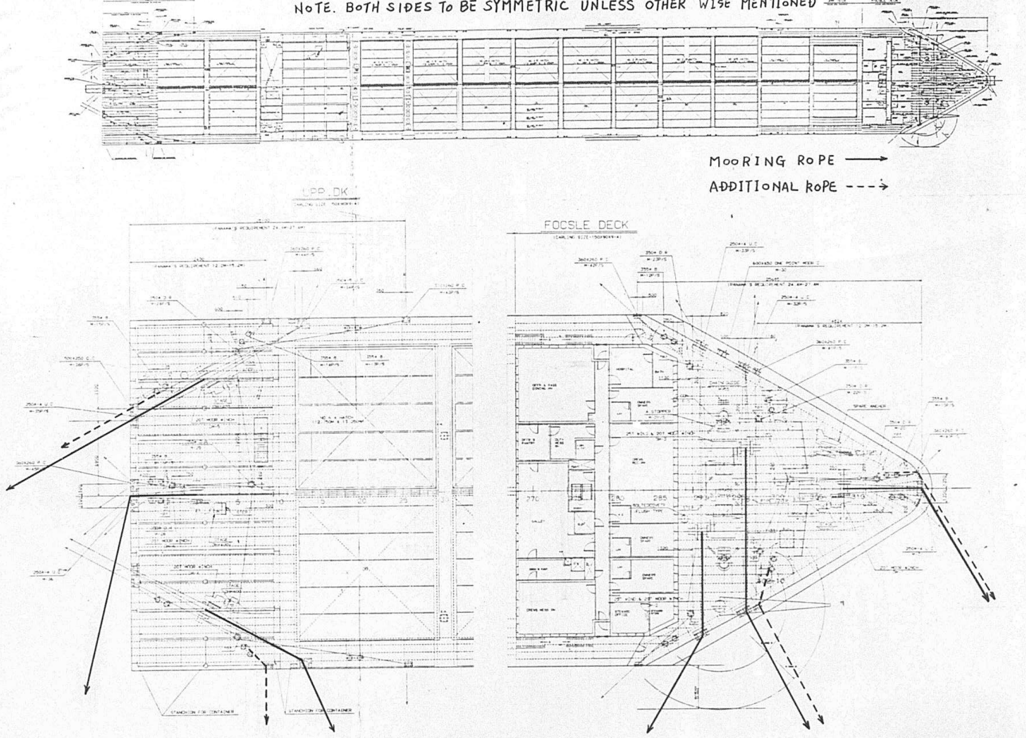
DWG. NO.

1016

4/

ROUGH ARR. OF MOORING ROPE

NOTE. BOTH SIDES TO BE SYMMETRIC UNLESS OTHER WISE MENTIONED



3/3

ANCHOR, CHAIN CABLE & MOORING ROPES
(PER ONE SHIP)

ITEM	DIMENSIONS	MATERIAL	REMARKS
BOWER ANCHORS (STOCKLESS TYPE)	7.875 t x 2 7.875 t x 1 (SPARE)	CAST STEEL	~~JIS F3301~~ AC 14
STUD LINK CHAIN CABLE	78 m/mφ x 330 m P.SIDE 330 m S.SIDE	ELEC. WELDED SPECIAL QUALITY STEEL	GRADE 3
~~TOW LINE~~	~~2.5 m, [ ] m/mφ, [ ] m x 1~~	~~STEEL WIRE~~	~~6 x 37~~
MOORING ROPE (OFE)	2.5 m, 56 m/mφ 135 m x 6	KARAT MAXI	8-PLY (ON WINCH)
MOORING ROPE (OFE)	2.5 m, 60 m/mφ, 2.5 m 200 m x 6	KARAT MAXI	8-PLY
~~FIRE LINES~~	~~2.5 m, [ ] m/mφ, 2.5 m, [ ] m x2~~	~~STEEL WIPE~~	~~6 x 37~~

ANCHOR GEAR FITTINGS
(PER ONE SHIP)

MARK	ITEM	NOS.	DR. NO.	REMARKS
M-1 P/S	CHAIN CONTROLLER ~~DOG~~ ~~TONGUE~~ ROLLER TONGUE TYPE, CAST STEEL	2	4102203 (注)4202222	PLESE REFER TO OUR DWG 4102203
M-2 P/S	ANCHOR STOPPER	2	(注)4202254	SUBMITTED SEPARATELY
—	ANCHOR BUOY	2	(注)4202252	

6/

MOORING GEAR FITTING (1/2)
(PER ONE SHIP)

MARK	ITEM	UNIT: m/m	NOS.	DR. NO.	REMARKS
~~M-10, M-16~~	BOLLARD	~~400~~ φ	~~2~~		
M-10 P/S ~ M-16 P/S ~~M-11 P/S ~ M-15 P/S~~	BOLLARD	355 φ	14 ~~10~~	(製)4102241	
	BOLLARD	[ ] φ			
M-18 P/S	CROSS BITT	350 φ	2	(図)4102250	
~~ ~~	~~ROLLER FAIRLEADER~~	~~[ ] x [ ] φ~~		~~(注)4102123~~	
M-20, M-21 M-25, M-26	DECK ROLLER	350 φ	4	(注)4202223	
M-22 P/S ~ M-24 P/S	DECK ROLLER	350 φ	6	(図)4102250	
M-30	MOORING PIPE	600 x 450	1	(注)4202224	
	MOORING PIPE	[ ] x [ ]			
	MOORING PIPE	[ ] x [ ]			
	UNIVERSAL CHOCK	PENDULUM TYPE			
M-31, M-32 P/S, M-36 M-33 P/S, M-35 P/S	UNIVERSAL CHOCK	MULTI-ROLL. TYPE	8	(注)4202225	
M-34 P/S	UNIVERSAL CHOCK	MULTI-ROLL. TYPE	2		WITH GUIDE ROLLER
M-38 P/S	CLOSED CHOCK	500 x 250	2	(注)4202224	
	CLOSED CHOCK	[ ] x [ ]			
	CLOSED CHOCK	[ ] x [ ]			
~~M-45 P/S~~ M-46 P/S M-43 P/S	PANAMA CHOCK "A" TYPE	310 x 260	4 ~~6~~ ~~2~~	(注)4202224	
M-45 P/S M-44 P/S, ~~M-45~~	PANAMA CHOCK "A" TYPE	360 x 260	4 2 ~~3~~		
M-40 P/S, M-42 P/S ~~M-40~~, M-41 P/S	PANAMA CHOCK "B" TYPE	360 x 260	6 ~~2~~ ~~3~~	(注)4202224	
~~M-40 P/S~~ ~~M-42 P/S~~	PANAMA CHOCK "B" TYPE	~~310 x 260~~	~~4~~ ~~2~~		
	TUG BITT	[ ] φ		(予)	
	TUG BITT	[ ] φ			
M-50 P/S ~ M-53 P/S	TUG BITT	250 φ	8	(図)4102251	45 TON

7/

MOORING GEAR FITTINGS (2/2)
(PER ONE SHIP)

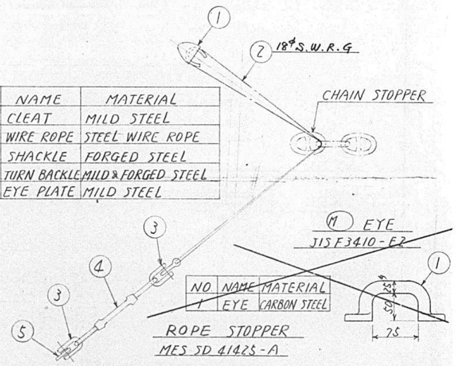
MARK	ITEM		NOS.	DR.NO.	REMARKS
	HORIZONTAL ROLLER	SINGLE		(図)	
		DOUBLE			
	DECK END ROLLER			(注)	
	WIRE REEL	WITH AIR MOTOR		(注)	FOR FIRE LINE
	HAWSER REEL	WITH AIR MOTOR		(注)	FOR SPARE HAWSER
M-55	CHAIN GUIDE		1	(図)4102250	
	EYE FOR ROPE STOPPER			(予)	FOR MOOR.ROPE
	CHAIN STOPPER			(注)	FOR MOOR.ROPE
—	ROPE STOPPER		4	(注)4202253	FOR MOOR.ROPE
—	SNATCH BLOCK		2	(注)4202251	

注： WORKING NOTES:

1. (製) … 製造表， (注) … 注文要領書， (予) … MES予量表， (図) … 製作図面
2. 参照図面
   a) 係船金物台　(設)関連工事　DR. NO. 4102240
   b) デツキローラー台　(船)関連工事　DR. NO. 4102250

8/

(M-2 P/S) ANCHOR STOPPER
JIS F3307

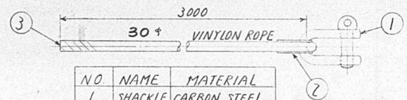


NO	NAME	MATERIAL
1	CLEAT	MILD STEEL
2	WIRE ROPE	STEEL WIRE ROPE
3	SHACKLE	FORGED STEEL
4	TURN BACKLE	MILD & FORGED STEEL
5	EYE PLATE	MILD STEEL

(M) EYE
JIS F3410-F2

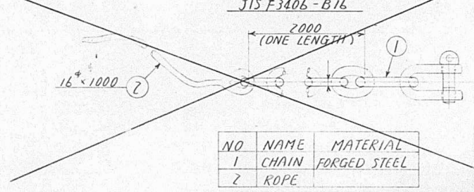
NO	NAME	MATERIAL
1	EYE	CARBON STEEL

ROPE STOPPER
MES SD 41425-A



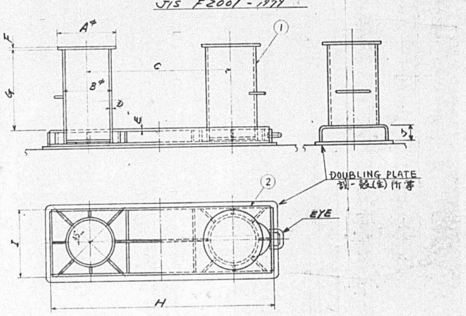
NO.	NAME	MATERIAL
1	SHACKLE	CARBON STEEL
2	THIMBLE	CARBON STEEL
3	ROPE	VINYLON ROPE

CHAIN STOPPER
JIS F3406-B16



NO	NAME	MATERIAL
1	CHAIN	FORGED STEEL
2	ROPE	

(M-10 P/S)~(M-16 P/S) BOLLARD
JIS F2001-1979



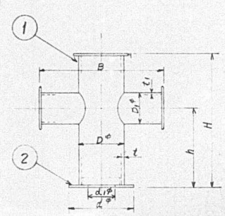
NO.	NAME	MATERIAL
1	PILLAR	STEEL PIPE OR MILD STEEL
2	SEAT	MILD STEEL

NOMINAL DIAM	A	B	C	D	E	F	G	H	I	J
200	270	215	500	10	8	9	300	860	290	85
250	330	265	630	11	10	9	380	1065	360	100
315	385	320	800	15	12	9	480	1300	430	125
355	425	355	890	17	13	12	530	1475	480	145
400	480	405	1000	18	14	12	600	1630	550	160
450	550	460	1130	19	16	12	680	1840	620	170
500	610	510	1250	20	18	12	750	2040	690	190

M-10P/S ~M-16P/S

9/

(M-18) CROSS BITT
JIS F2804



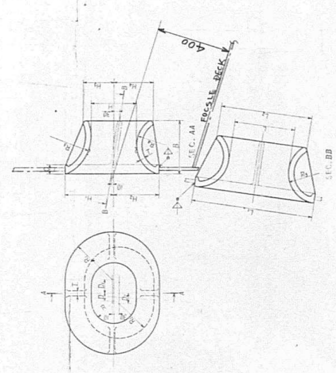
NO	NAME	MATERIAL
1	BODY	STEEL PIPE & MILD STEEL
2	LINER	MILD STEEL

NOMINAL DIAM.	H	h	B	D	D1	d / d1	t	t1
150	498	288	460	165.2	114.3	240	11.0	8.6
200	570	330	520	216.3	165.2	280	12.7	11.0
250	652	372	610	267.4	216.3	340	15.1	12.7
300	694	394	660	318.5	267.4	400	17.4	15.1
350	734	434	720	355.6	267.4	440 / 240	19.0	15.1

1018

(M-30) MOORING PIPE
JIS F2030-B

NO.	NAME	MATERIAL
1	MOORING PIPE	CAST STEEL

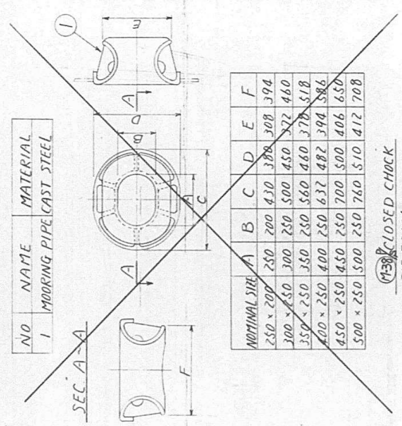


UNIT. mm

NOMINAL DIMENSION	L	L_1	L_2	H	H_1	H_2	H_3	H_4	B	R	R_1	R_2	R_3	R_4	R_5	T	C	D	D_1	D_2	WEIGHT
400	400	800	640	300	320	300	200	260	350	150	310	230	270	200	250	33	63	50	90	70	190
500	500	960	720	400	370	350	250	310	400	200	360	280	300	240	230	34	70	50	120	80	310
600	600	1120	840	450	420	400	300	360	450	225	410	330	330	260	260	35	75	75	150	90	460
700	700	1280	960	500	470	450	350	410	500	250	460	380	350	280	290	30	80	100	180	100	660
800	800	1440	1080	600	520	500	400	460	520	300	510	430	370	320	320	35	83	100	210	110	830

(M) MOORING PIPE
JIS F2007-A

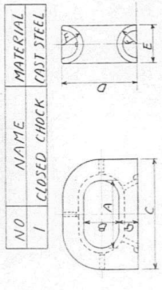
NO	NAME	MATERIAL
1	MOORING PIPE	CAST STEEL



NOMINAL SIZE	A	B	C	D	E	F
250 × 200	250	200	430	380	308	394
300 × 250	300	250	500	450	372	460
350 × 250	350	250	560	460	378	518
400 × 250	400	250	632	482	394	586
450 × 250	450	250	700	500	406	650
500 × 250	500	250	760	510	412	708

(M-38) CLOSED CHOCK
JIS F2005

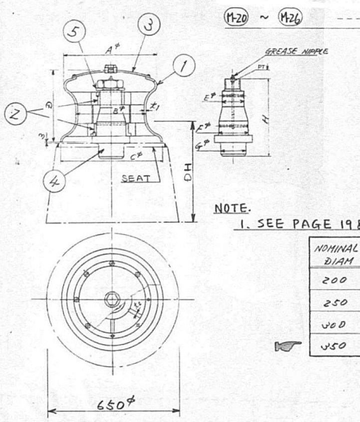
NO	NAME	MATERIAL
1	CLOSED CHOCK	CAST STEEL



NOMINAL SIZE	A	B	C	D	E	F	G
250 × 200	250	200	434	372	160	80	80
300 × 250	300	250	528	464	200	100	100
350 × 250	350	250	600	485	220	110	110
400 × 250	400	250	672	506	240	120	120
450 × 250	450	250	746	528	260	130	130
500 × 250	500	250	820	550	280	140	140

ROLLER
JIS F 2014

(M-20) ~ (M-26) ---- FOR DECK ROLLER



NO.	NAME	MATERIAL
1	ROLLER	STEEL PLATE
2	BUSH	CAST BRONZE
3	COVER	STEEL PLATE
4	PIN	CARBON STEEL
5	WASHER	STEEL PLATE

NOTE.
1. SEE PAGE 19 & 20.

NOMINAL DIAM	A	B	C	D	E	F	G	H	t_1	t_2
200	280	200	310	235	70	90	80	254	10	10
250	340	250	380	282	80	105	90	301	10	10
300	400	300	440	305	95	125	110	331	12	12
350	455	350	500	330	110	145	125	359	16	16

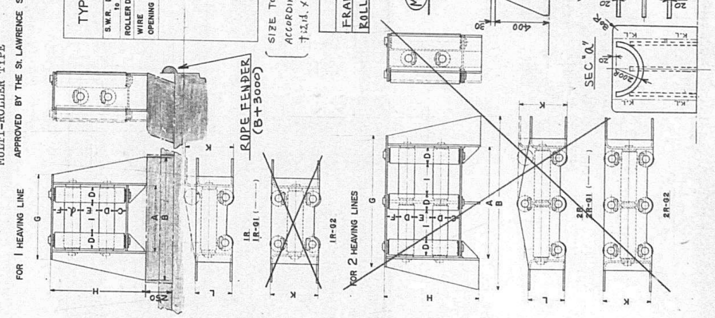
(M-31) ~ (M-36) UNIVERSAL CHOCK
MULTI-ROLLER TYPE
APPROVED BY THE St. LAWRENCE SEAWAY AUTHORITY IN CANADA

DIMENSIONS (MM)

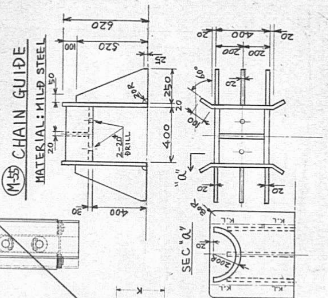
TYPE		FOR 1 H.LINE 1R, 1R-G1, ~~1R-G2~~		FOR 2 H.LINES 2R, 2R-G1, 2R-G2	
S.W.R. DIA. to —		28	33.5	28	38
ROLLER DIA.	D	127	269.4 / 165.2	127	160
WIRE OPENING	E	150	199	150	180
	I	250	253	250	300
	A	635	825	910	1120
	B	1020	1325	1430	750
	C	100	61.3	100	120
	F	100	27.4	100	120
	G	730	1025	1700	1320
	H	820	800	820	950
	L	300	550	300	380
	K	380	800	380	480

(SIZE TO BE SLIGHTLY CHANGED ACCORDING TO MAKER'S STANDARD
寸法は、メーカー標準により、多少変更有り。)

	MATERIAL
FRAME	MILD STEEL
ROLLER	CARBON STEEL PIPE



(M-35) CHAIN GUIDE
MATERIAL: MILD STEEL

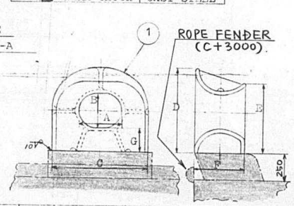


14/

(M-40)P/S ~ (M-46)P/S PANAMA CHOCK

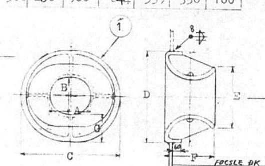
NO	NAME	MATERIAL
1	PANAMA CHOCK	CAST STEEL

A. TYPE
JIS F2017-A



NOMINAL SIZE	A	B	C	D	E	F	G	
310 X 250	310	260	708	639	531	358	180	(M-43)P/S (M-46)P/S
360 X 250	360	260	760	640	532	358	180	(M-44)P/S (M-45)P/S
400 X 250	400	260	804	642	535	358	180	
450 X 250	450	260	856	643	537	358	180	
500 X 250	500	260	908	644	539	358	180	

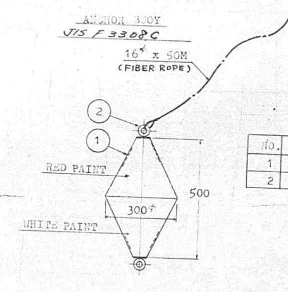
B. TYPE
JIS F2017-B



NOMINAL SIZE	A	B	C	D	E	F	G	DH	
360 X 260	310	260	734	684	462	358	212	500	(M-42)P/S (M-40)P/S
360 X 260	360	260	784	688	464	358	214	400	(M-41)P/S
400 X 260	400	260	832	692	470	358	216		
450 X 260	450	260	886	696	474	358	210		
500 X 260	500	260	940	700	470	358	220		

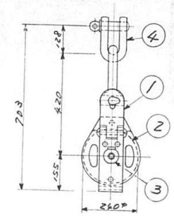
15/

ANCHOR BUOY
JIS F 3308 C



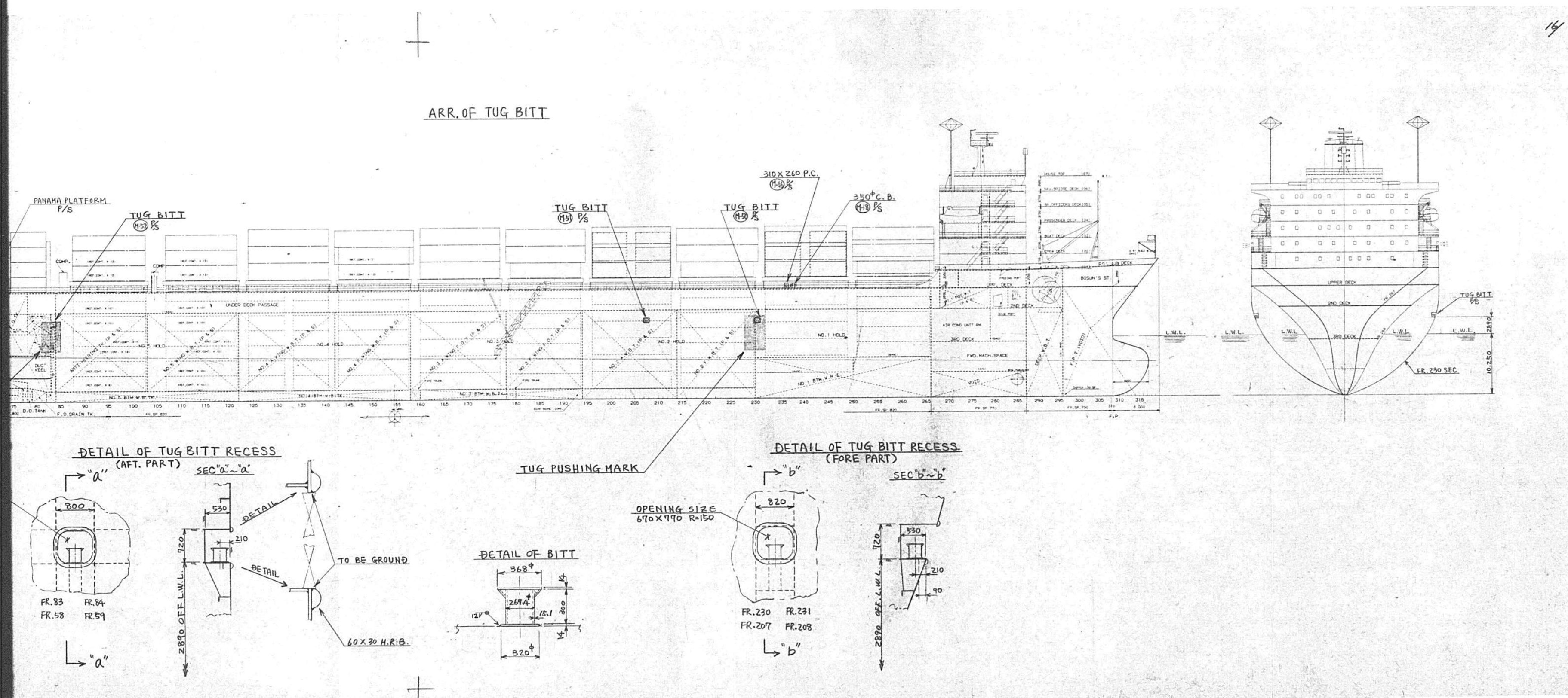
NO.	NAME	MATERIAL
1	BODY	MILD STEEL
2	EYE	MILD STEEL

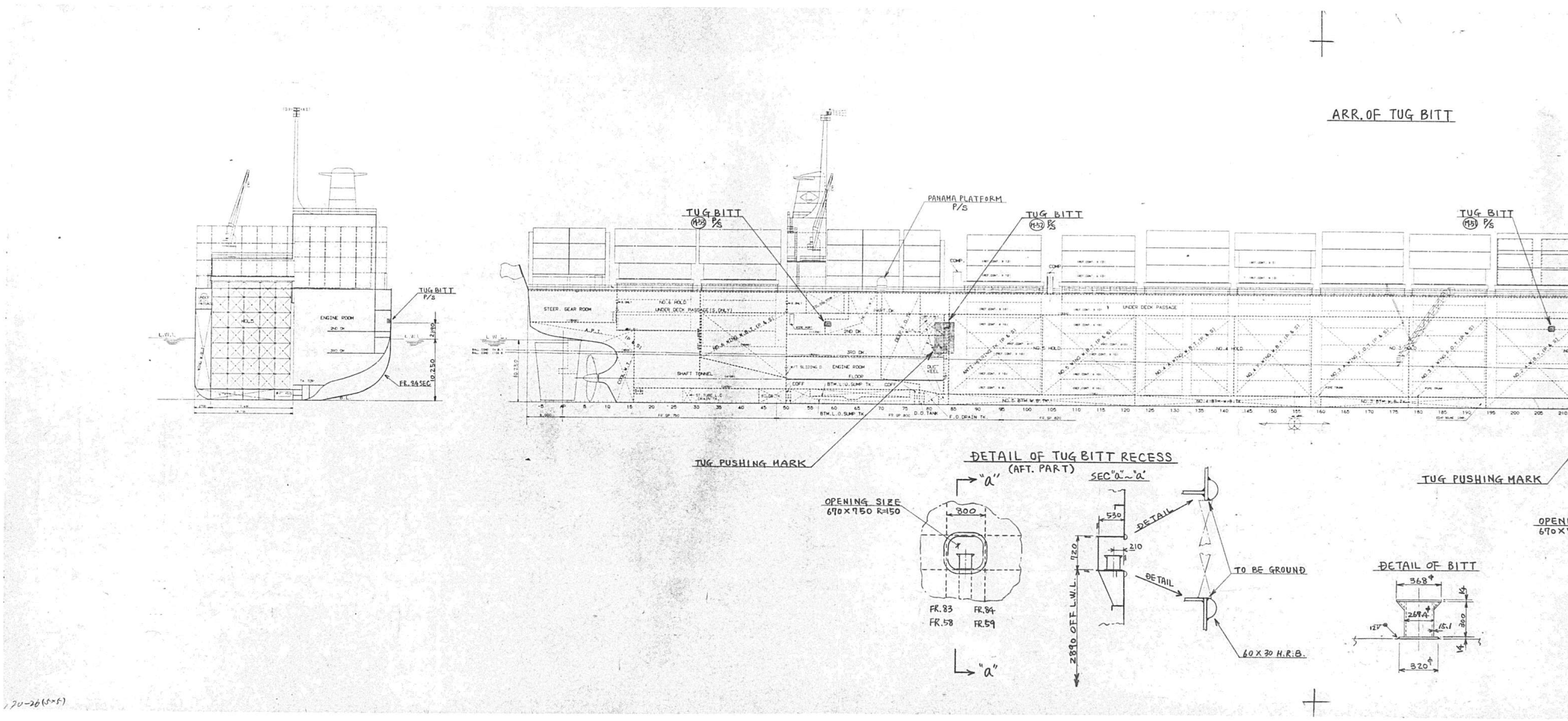
SNATCH BLOCK
JIS F 3422
(S.W.L 3T)



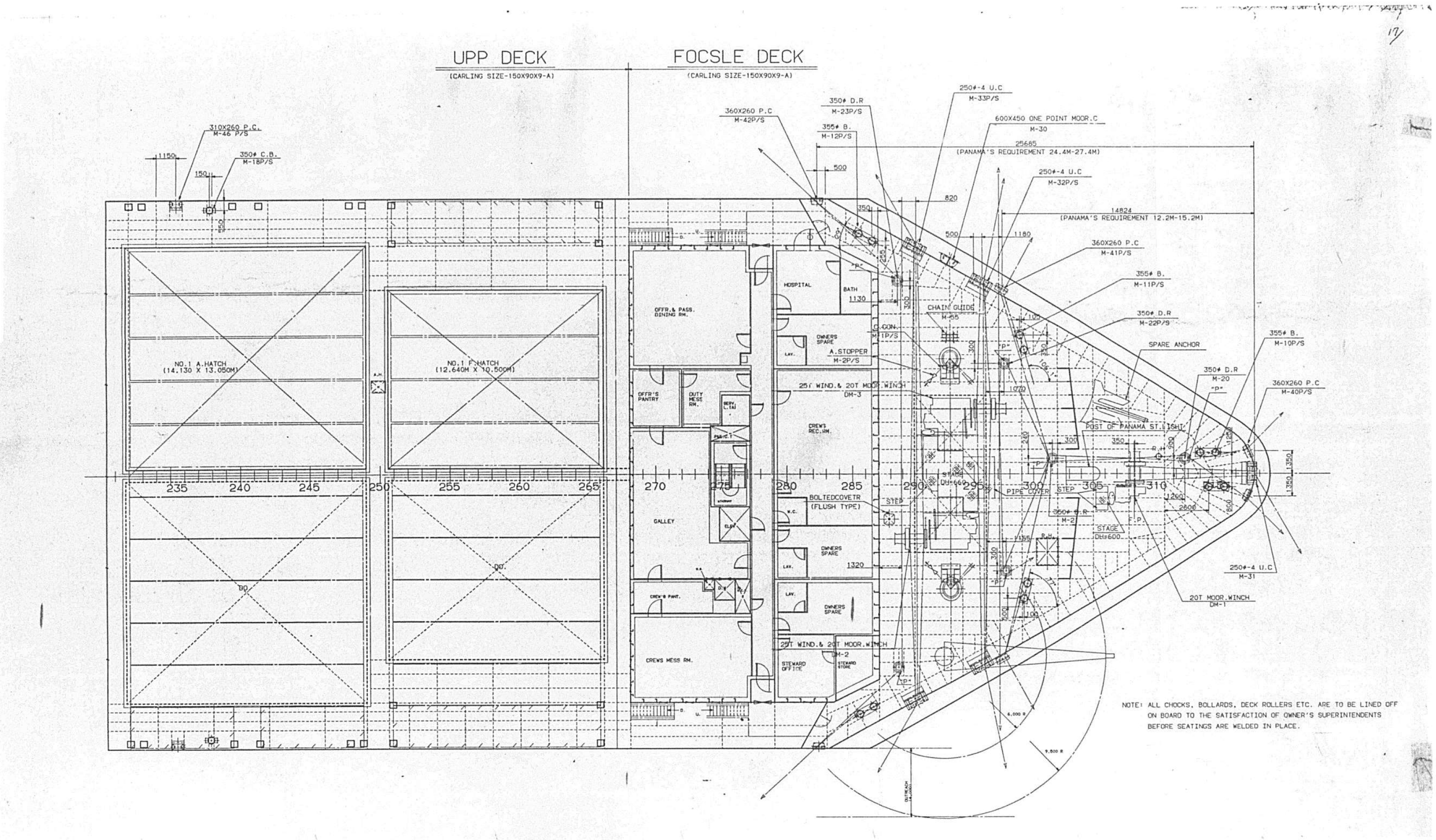
NO.	NAME	MATERIAL
1	FRAME	MILD & FORGED STEEL
2	SHEAVE	CAST STEEL
3	PIN	FORGED STEEL
4	SHACKLE	CARBON STEEL

1020


ARR. OF TUG BITT
PANAMA PLATFORM P/S
TUG BITT
310 X 260 P.C.
350$^{\phi}$ C. B.
TUG PUSHING MARK
DETAIL OF TUG BITT RECESS (AFT. PART)
SEC "a"~"a"
DETAIL
TO BE GROUND
60 X 30 H.R.B.
2890 OFF L.W.L.
FR.83 FR.84
FR.58 FR.59
DETAIL OF BITT
DETAIL OF TUG BITT RECESS (FORE PART)
SEC "b"~"b"
OPENING SIZE 670 X 770 R=150
FR.230 FR.231
FR.207 FR.208
FR.230 SEC.
UPPER DECK
2ND DECK
L.W.L.

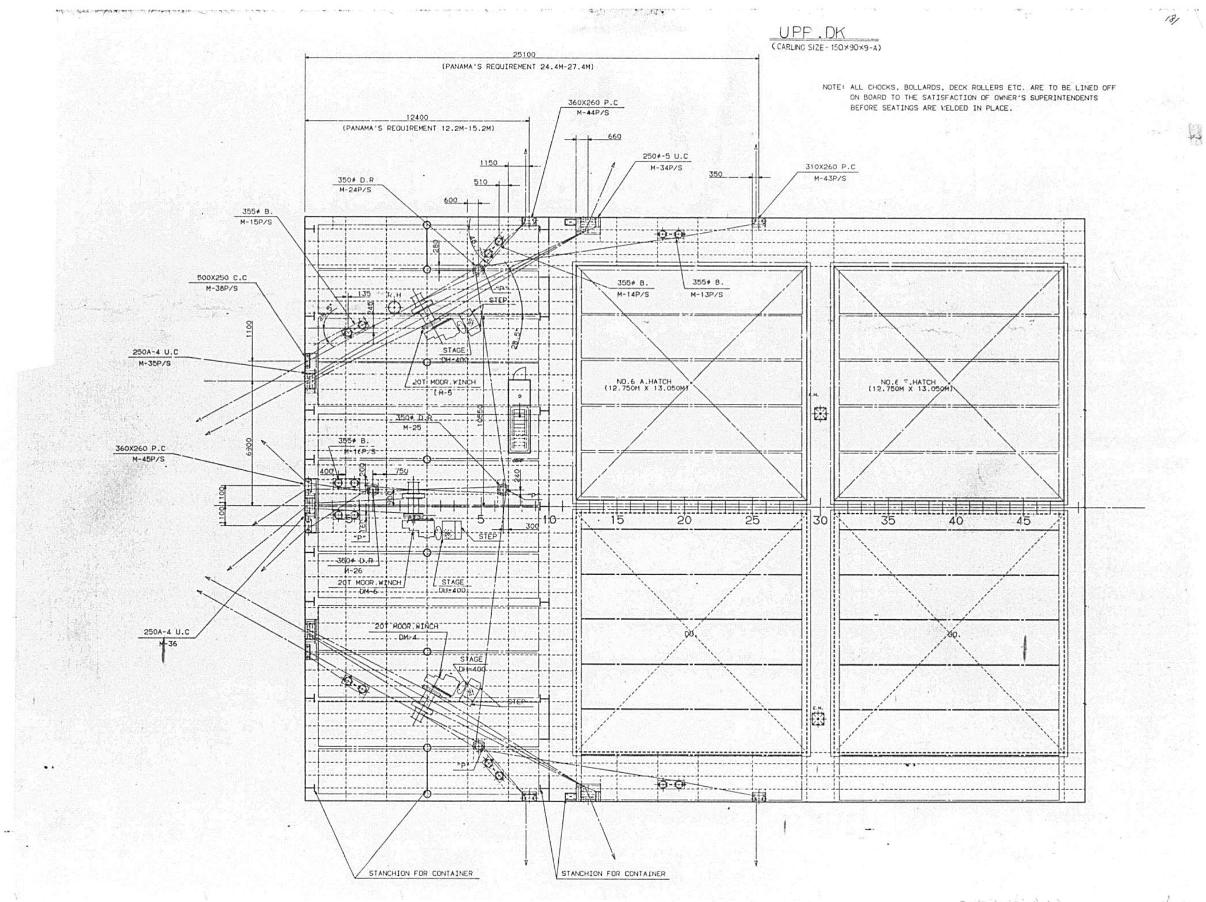


ARR. OF TUG BITT
TUG BITT
P/S
PANAMA PLATFORM
TUG PUSHING MARK
STEER. GEAR ROOM
ENGINE ROOM
SHAFT TUNNEL
UNDER DECK PASSAGE
FR.98SEC
10,250
DETAIL OF TUG BITT RECESS
(AFT. PART)
SEC "a"-"a"
"a"
OPENING SIZE
690×750 R=150
800
530
310
920
2890 OFF L.W.L.
FR.83
FR.84
FR.58
FR.59
DETAIL
TO BE GROUND
60×30 H.R.B.
DETAIL OF BITT
368
269.4
320



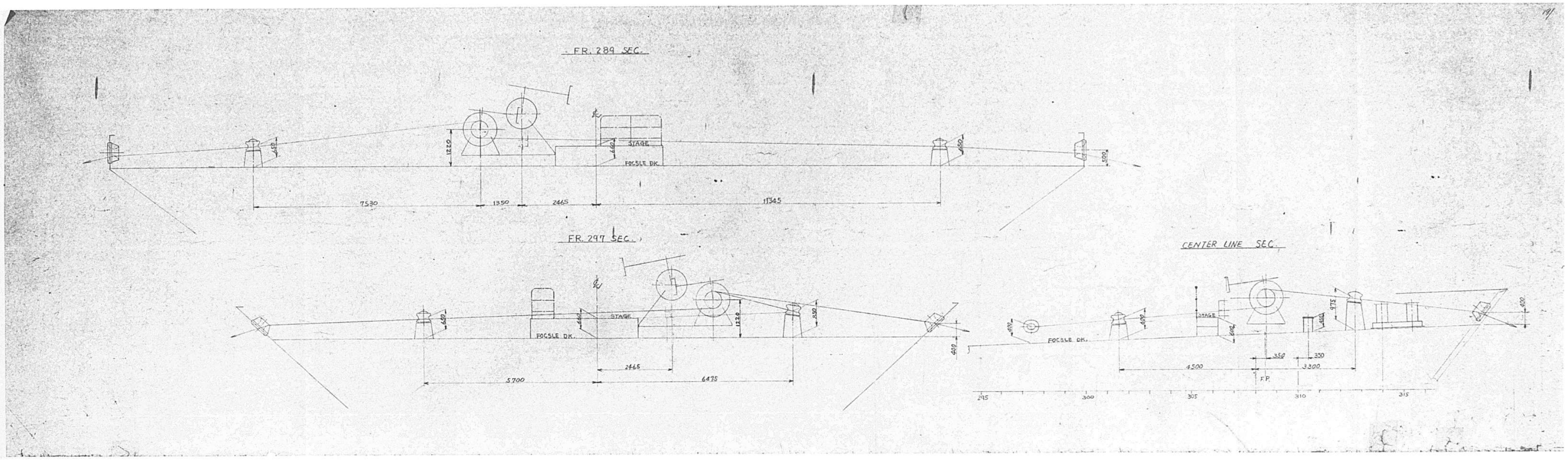
UPP DECK
(CARLING SIZE-150X90X9-A)
FOCSLE DECK
(CARLING SIZE-150X90X9-A)
NO.1 A.HATCH
(14.130 X 13.050M)
NO.1 F.HATCH
(12.640M X 10.500M)
OFFR.& PASS. DINING RM.
GALLEY
CREWS MESS RM.
HOSPITAL
BATH
OWNERS SPARE
CREWS REC.RM
STEWARD OFFICE
A.STOPPER
CHAIN GUIDE
SPARE ANCHOR
25T WIND.& 20T MOOR.WINCH
20T MOOR.WINCH
POST OF PANAMA ST.LIGHT
BOLTED COVER (FLUSH TYPE)
(PANAMA'S REQUIREMENT 24.4M-27.4M)
(PANAMA'S REQUIREMENT 12.2M-15.2M)
600X450 ONE POINT MOOR.C
NOTE: ALL CHOCKS, BOLLARDS, DECK ROLLERS ETC. ARE TO BE LINED OFF ON BOARD TO THE SATISFACTION OF OWNER'S SUPERINTENDENTS BEFORE SEATINGS ARE WELDED IN PLACE.

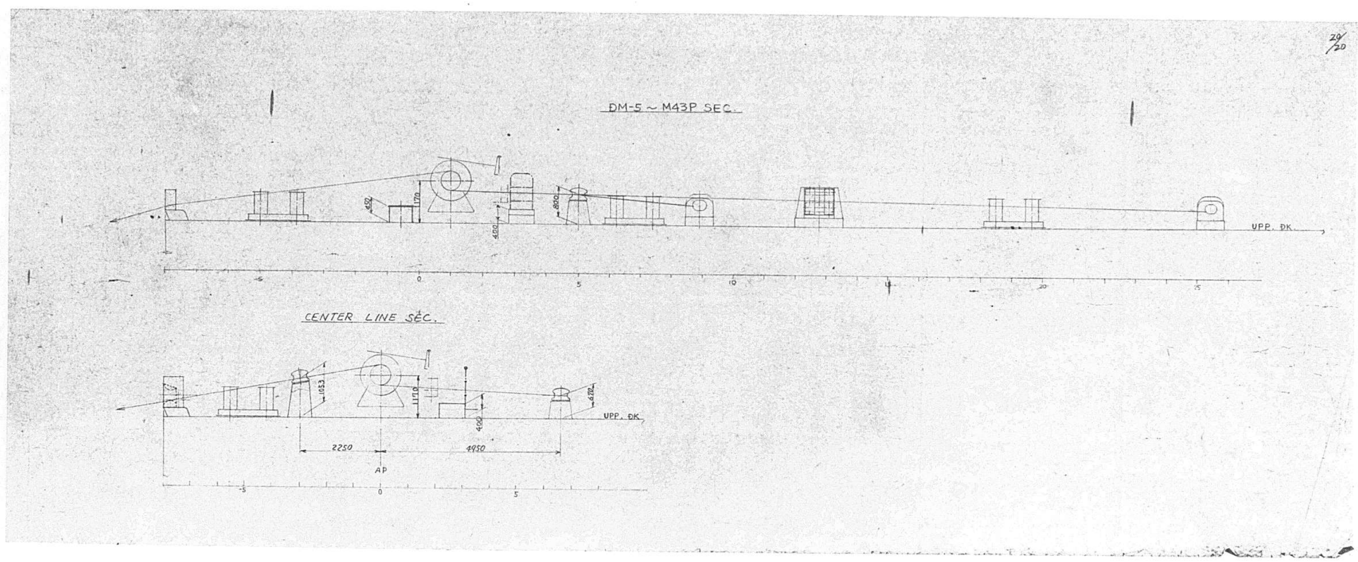
1023



UPP. DK
(CARLING SIZE - 150×90×9-A)
NOTE: ALL CHOCKS, BOLLARDS, DECK ROLLERS ETC. ARE TO BE LINED OFF ON BOARD TO THE SATISFACTION OF OWNER'S SUPERINTENDENTS BEFORE SEATINGS ARE WELDED IN PLACE.
25100
(PANAMA'S REQUIREMENT 24.4M-27.4M)
12400
(PANAMA'S REQUIREMENT 12.2M-15.2M)
NO.6 A.HATCH (12.750M X 13.050M)
STANCHION FOR CONTAINER
STANCHION FOR CONTAINER

1024


FR. 289 SEC.
STAGE
FOCSLE DK.
7530
1350
2465
11545
FR. 297 SEC.
STAGE
FOCSLE DK.
5700
2465
6475
CENTER LINE SEC.
STAGE
FOCSLE DK.
4300
350
350
3300
F.P.
295
300
305
310
315



1026

1/6

APPROVAL OF OWNER & REGULATORY BODIES								
ALT. NO.	OWNER		USCG		ABS		USPH	
	DATE	LETTER NO.	DATE	LETTER NO.	DATE	LETTER NO.	DATE	LETTER NO.
ORIGINAL	22.SEP.'85	TAM/73						

FINISHEDPLAN

SHIPYARD AND SHIP'S NO. & NAME			
MITSUI TAMANO		MITSUBISHI KOBE	
NO.1323	DOCTOR LYKES	NO.1158	JAMES LYKES
NO.1324	ALMERIA LYKES	NO.1159	JOSEPH LYKES
NO.1325	TILLIE LYKES	NO.1164	SOLON TURMAN

MITSUI ENGINEERING & SHIPBUILDING CO., LTD.
TAMANO WORKS

SHIP DESIGN DEPARTMENT MANAGER
SHIP'S NO. NO.1325
SHIP'S NAME TILLIE LYKES

OUTFITTING DESIGN SECTION
SEC. CHIEF

DETAIL OF DECK ROLLER SEATING

NOV. 11 1986 SHIP DESIGN DEPARTMENT

DATE
JOB NO. TS1323/24/25
JOBCLASSIF. NO.
SCALE
LYKES REF. NO. 260505
MITSUI DRAWING NO. 4102250

(6 SHEETS WITH COVER)

2/

PLAN RECORD

ALT. NO.	MARK	ALTERATION/DESCRIPTION	DATE & SIGNATURE
1		PREPARED FOR S.NO. 1323 AS FINSHED PLAN, MADE APPLICABLE TO S.NO. 1324 AND S.NO. 1325.	NOVEMBER. 20. 86

DWG. NO. 4102250

3/

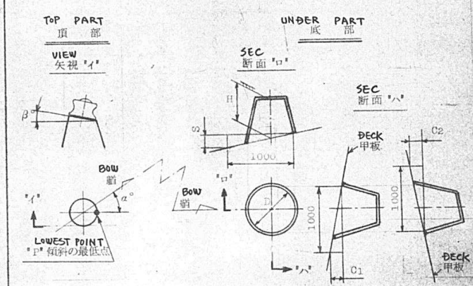
GENERAL NOTE

DWG. NO. 4102250

1027

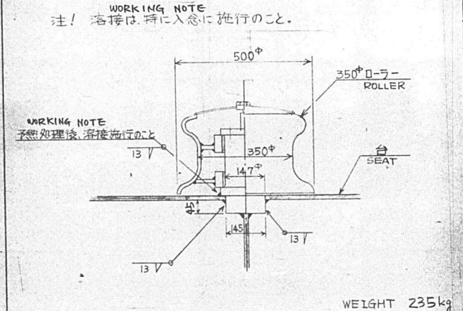
① DECK ROLLER SEATING
デッキローラー台製造表（製造個数は１隻分を示す 3 隻分製造のこと）

製品符号	H	D	頂部 α°	頂部 β°	底部 S	底部 C1	底部 C2	製造数	記事
M-20	875	650	0°	7°	33.6	0	0	1 SET	
M-21	500	↓	180°	5°	↓	0	0	↓	
M-22P	750		270°	9°		0	0		
M-22S	550		90°	2°		0	0		
M-23P	550		222°	2°		0	0		
M-23S	550		65°	8°		0	0		
M-24P	700		332°	1.5°			10.3		
M-24S	700		28°	1.5°		10.3			
M-25	570		0°	3°			10.3		
M-26	950		180°	9°			10.3		
M-									
M-									

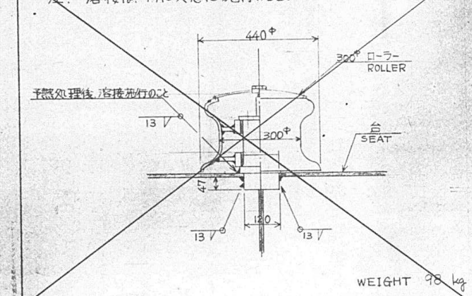


デッキローラー用ローラー取付要領（鋼板製）
ROLLER FOR DECK ROLLER (ST. PLATE)

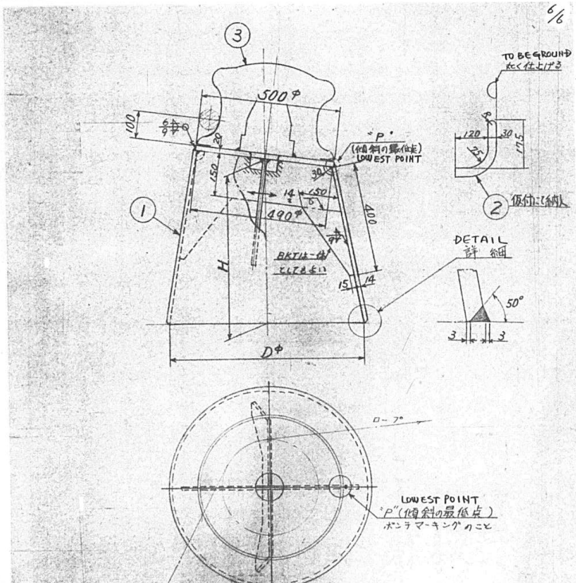
注！ 溶接は、特に入念に施行のこと。 (WORKING NOTE)



注！ 溶接は、特に入念に施行のこと。



三井造船株式会社



符号 NO.	名称 NAME	材料 MATERIAL	試験片 TEST PIECE	常備 USE	予備 SPARE	合計 TOTAL	関係工場 WORK SHOP	1個 ONE	合計 TOTAL	記事 REMARKS
3	ROLLER ローラー	——		/	/	⑪		235		4202223
2	ROPE GUIDE ロープガイド	MILD STEEL SS41		/	/	⑪ ⑪				60×30 H.R.B
1	SEAT 台	MILD STEEL SS41		/	/	⑪ ⑪				

製造個数は １組 分を示す ——（１隻分）—— 隻分製造のこと。

350φ DECK ROLLER SEATING デッキローラー台 尺度 SCALE 1/10

TS. DR. NO. PAGE

APPROVAL OF OWNER & REGULATORY BODIES

ALT. NO.	OWNER DATE	OWNER LETTER NO.	USCG DATE	USCG LETTER NO.	ABS (FOR REFERENCE) DATE	ABS LETTER NO.	USPH DATE	USPH LETTER NO.
ORIGINAL	APR.17.85	OFTS/MES 300						
REV. A	JUL.17.85	OFTS/MES 767			JAN.23 '86	TT/my 7-8-2		
REV. B	DEC.13.85	OFTS/MES 1111						

FINISHEDPLAN

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SHIPYARD AND SHIP'S NO. & NAME			
MITSUI TAMANO		MITSUBISHI KOBE	
NO.1323	DOCTOR LYKES	NO.1158	JAMES LYKES
NO.1324	ALMERIA LYKES	NO.1159	JOSEPH LYKES
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MITSUI ENGINEERING & SHIPBUILDING CO.,LTD.
TAMANO WORKS

SHIP DESIGN DEPARTMENT MANAGER — SHIP'S NO. **NO.1325** — SHIP'S NAME **TILLIE LYKES**

OUTFITTING DESIGN SECTION

SEC.CHIEF

コンテナ配置

ARR. OF CONTAINERS

DATE (TEL 2235)

JCB NO. TS1323/24/25	SCALE 1/200	LYKES REF. NO. 270001	MITSUI DRAWING NO. 4104332

(7 SHEETS WITH COVER)

P.1/7

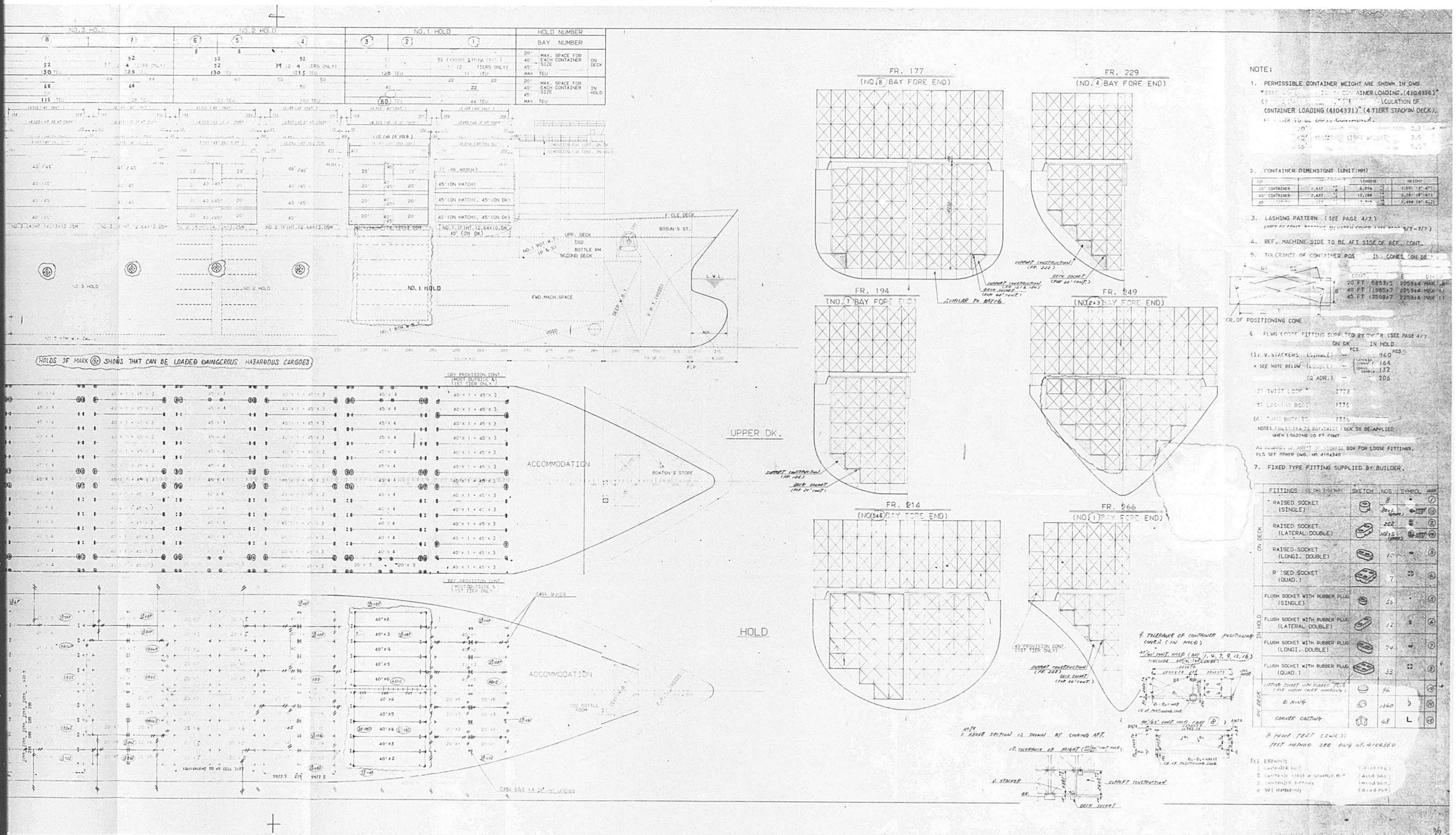
PLAN RECORD

ALT. NO.	MARK	ALTERATION/DESCRIPTION	DATE & SIGNATURE
1		PREPARED FOR S.NO. 1323 AS FINISHED PLAN, MADE APPLICABLE TO S.NO. 1324 AND S.NO. 1325.	NOVEMBER 20, 86

DWG. NO. 4104332

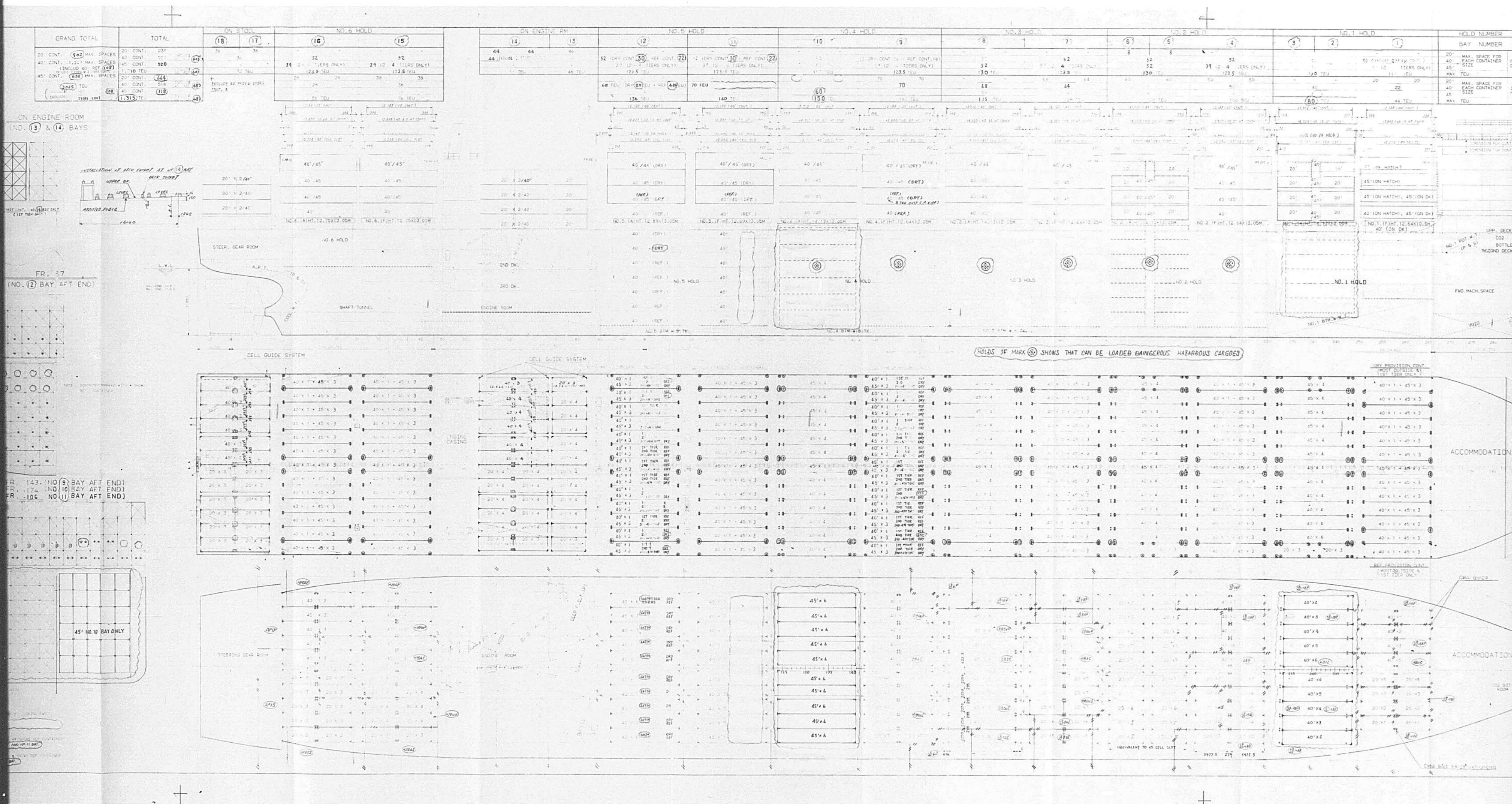
P.2/7

1029



NO.3 HOLD
NO.2 HOLD
NO.1 HOLD
HOLD NUMBER
BAY NUMBER
NO.1 HOLD
FWD. MACH. SPACE
HOLDS OF MARK ⊛ SHOWS THAT CAN BE LOADED DANGEROUS HAZARDOUS CARGOES
UPPER DK.
HOLD
ACCOMMODATION
BOATSN'S STORE
FR. 177
(NO.8 BAY FORE END)
FR. 229
(NO.4 BAY FORE END)
FR. 194
(NO.7 BAY FORE END)
FR. 249
FR. 214
FR. 266
NOTE:
1. PERMISSIBLE CONTAINER WEIGHT ARE SHOWN IN DWG
2. CONTAINER DIMENSIONS (UNIT:MM)
3. LASHING PATTERN (SEE PAGE 4/7)
4. REF. MACHINE SIDE TO BE AFT SIDE OF REF. CONT.
7. FIXED TYPE FITTING SUPPLIED BY BUILDER.
RAISED SOCKET (SINGLE)
RAISED SOCKET (LATERAL DOUBLE)
RAISED SOCKET (LONGI. DOUBLE)
FLUSH SOCKET WITH RUBBER PLUG (SINGLE)
FLUSH SOCKET WITH RUBBER PLUG (LATERAL DOUBLE)
FLUSH SOCKET WITH RUBBER PLUG (LONGI. DOUBLE)
FLUSH SOCKET WITH RUBBER PLUG (QUAD.)

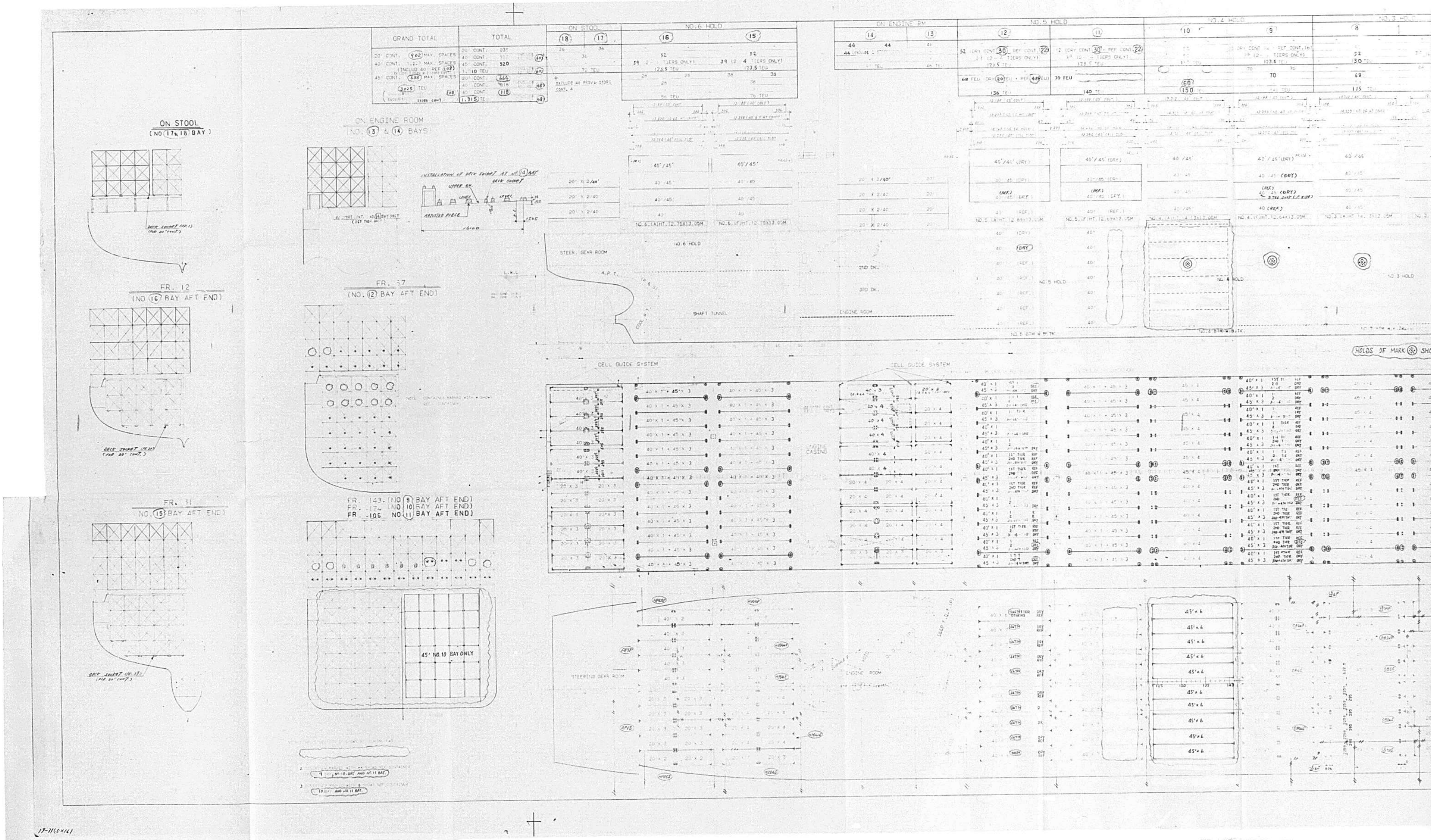
1/3 1030



GRAND TOTAL
TOTAL
ON STOOL
NO.6 HOLD
ON ENGINE RM
NO.5 HOLD
NO.4 HOLD
NO.3 HOLD
NO.2 HOLD
NO.1 HOLD
HOLD NUMBER
BAY NUMBER
ON ENGINE ROOM (NO. 13 & 14 BAYS)
FR. 57 (NO. 12 BAY AFT END)
STEER. GEAR ROOM
SHAFT TUNNEL
ENGINE ROOM
NO.1 HOLD
CELL GUIDE SYSTEM
HOLDS OF MARK SHOWS THAT CAN BE LOADED DAINGEROUS HAZARDOUS CARGOES
ACCOMMODATION
45' NO.10 BAY ONLY
ACCOMMODATION

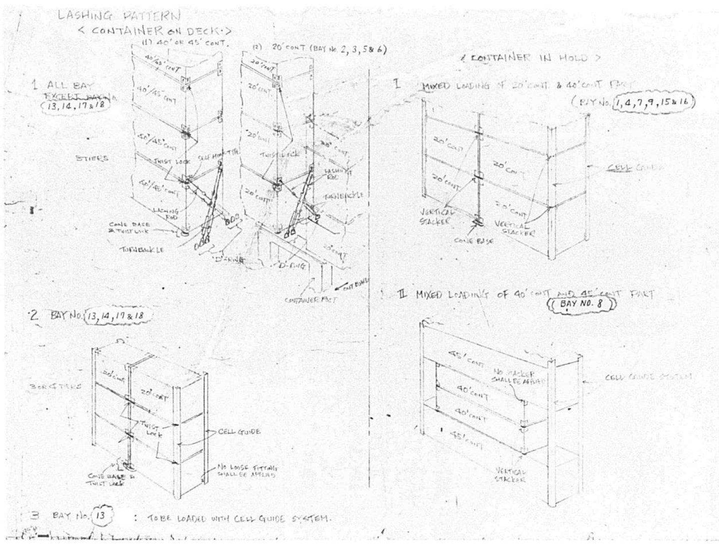
2/3

1031


GRAND TOTAL
TOTAL
ON STOOL
NO.6 HOLD
ON ENGINE RM
NO.5 HOLD
NO.4 HOLD
ON STOOL
(NO 17 & 18 BAY)
ON ENGINE ROOM
(NO. 13 & 14 BAYS)
FR. 12
(NO 16 BAY AFT END)
FR. 57
(NO 12 BAY AFT END)
FR. 31
(NO 15 BAY AFT END)
FR. 143 (NO 9 BAY AFT END)
FR. 174 (NO 10 BAY AFT END)
FR. 106 (NO 11 BAY AFT END)
45' NO.10 BAY ONLY
STEER. GEAR ROOM
SHAFT TUNNEL
ENGINE ROOM
CELL GUIDE SYSTEM
ENGINE CASING
HOLDS OF MARK SHOWS

3/3

1032



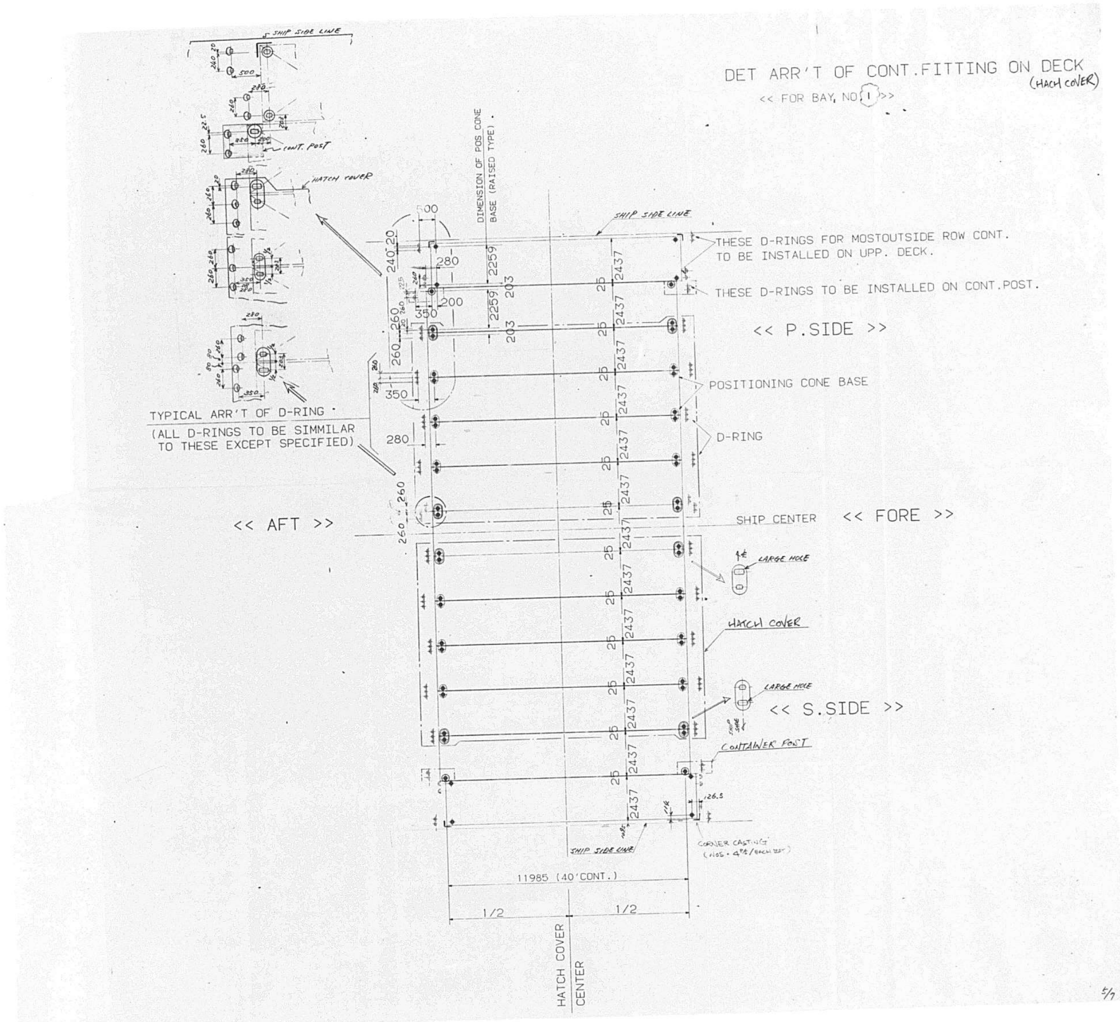
LIST OF LOOSE FITTING (OFE)

	LOOSE FITTING \ BAY NO.	1	2&3	4	5&6	7	8	9	10	11	12	13	14	15	16	17&18	TOTAL IN USE	SPARE	TOTAL
ON DECK	TWIST LOCK	208	232	208	232	208	208	208	208	208	208	-	320	208	208	240	3104	310	3414
	LASING ROD	104	116	104	116	104	104	104	104	104	104	-	-	104	104	-	1272	64	1336
	TURN-BUCKLE	104	116	104	116	104	104	104	104	104	104	-	-	104	104	-	1272	64	1336
IN HOLD	V. STACKER (SINGLE)	56		160	-	216	56	240	-	-	-	-	-	112	72	-	912	-	912
	" (LATERAL DOUBLE)	-		-	-	-	108	-	-	-	-	-	-		-	-	108	-	108
	" (LONG DOUBLE)	20	-	28	-	28	-	28	-	-	-	-	-	16	12	-	132	-	132
	V. STACKER (R'ADR)	12	-	36	-	50	-	56	-	-	-	-	-	30	22	-	206	-	206

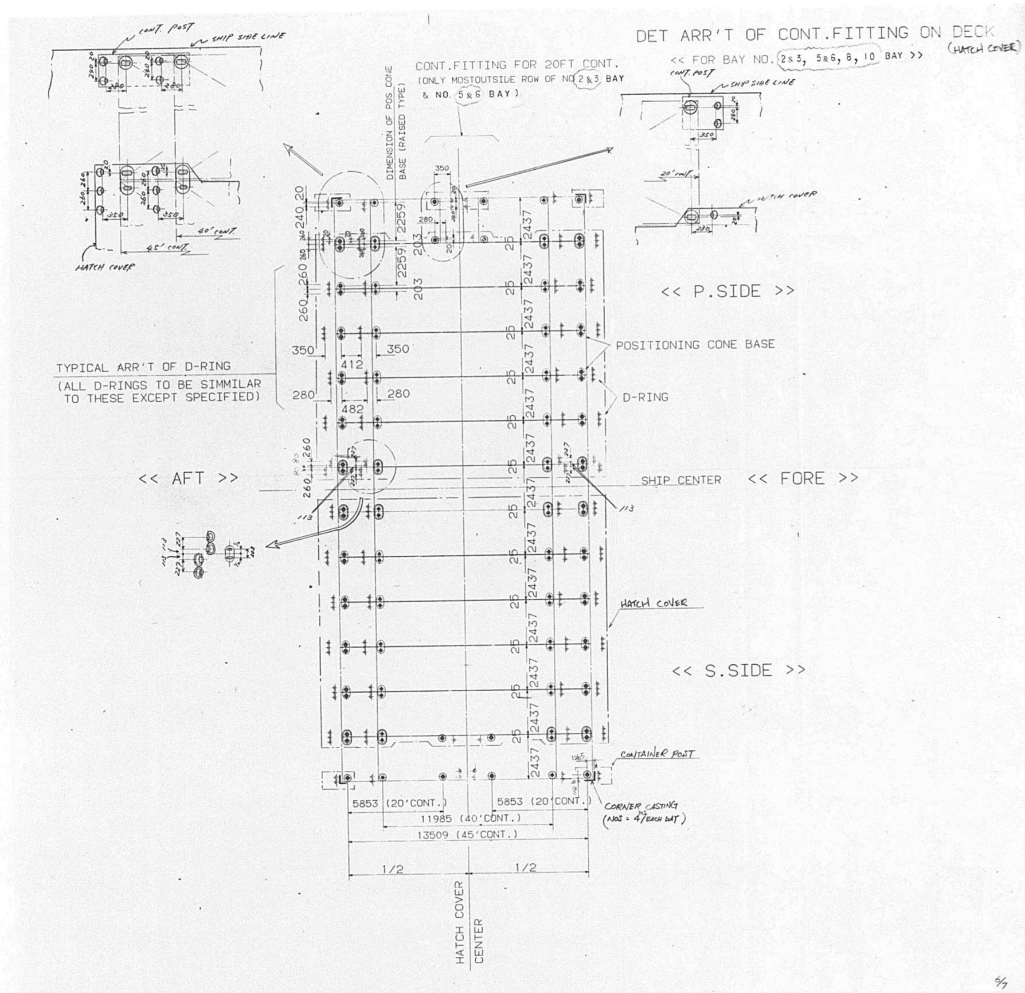
NOTE:
1. FITTINGS ON DECK ARE 10 PERCENT SPARES FOR TWISTLOCKS AND 5 PERCENT SPARES FOR RODS AND TURN-BUCKLES.
2. FITTINGS IN HOLD ARE NO SPARE.

DET ARR'T OF CONT.FITTING ON DECK (HACH COVER)

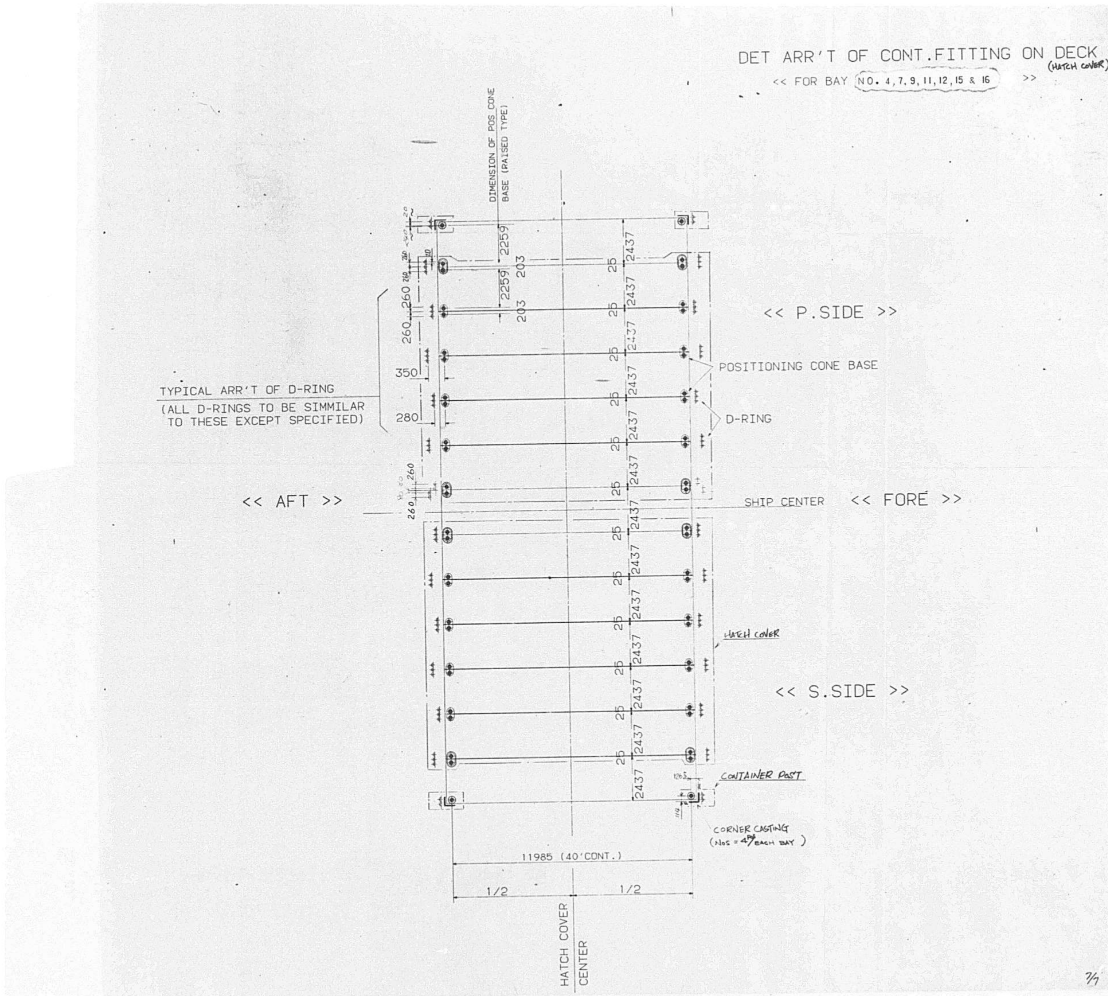
<< FOR BAY, NO.1 >>



1034



DET ARR'T OF CONT.FITTING ON DECK
(HATCH COVER)
<< FOR BAY NO. 2&3, 5&6, 8, 10 BAY >>
CONT.FITTING FOR 20FT CONT.
(ONLY MOSTOUTSIDE ROW OF NO.2&3 BAY & NO. 5&6 BAY)
DIMENSION OF POS.CONE BASE (RAISED TYPE)
TYPICAL ARR'T OF D-RING
(ALL D-RINGS TO BE SIMMILAR TO THESE EXCEPT SPECIFIED)
<< P.SIDE >>
POSITIONING CONE BASE
D-RING
<< AFT >>
SHIP CENTER
<< FORE >>
HATCH COVER
<< S.SIDE >>
CONTAINER POST
CORNER CASTING
5853 (20'CONT.)
11985 (40'CONT.)
13509 (45'CONT.)
1/2
HATCH COVER CENTER


DET ARR'T OF CONT.FITTING ON DECK (HATCH COVER)
<< FOR BAY NO. 4, 7, 9, 11, 12, 15 & 16 >>
DIMENSION OF POS CONE BASE (RAISED TYPE)
<< P.SIDE >>
POSITIONING CONE BASE
D-RING
TYPICAL ARR'T OF D-RING
(ALL D-RINGS TO BE SIMMILAR TO THESE EXCEPT SPECIFIED)
<< AFT >>
SHIP CENTER
<< FORE >>
HATCH COVER
<< S.SIDE >>
CONTAINER POST
CORNER CASTING
11985 (40'CONT.)
1/2
1/2
HATCH COVER CENTER

1036

1/47

APPROVAL OF OWNER & REGULATORY BODIES

ALT. NO.	OWNER DATE	OWNER LETTER NO.	USCG DATE	USCG LETTER NO.	ABS DATE	ABS LETTER NO.	USPH DATE	USPH LETTER NO.
ORIGINAL		OFTS/MES-1150						
1	JAN. 9. 86	OFTS/MES-1168						

FINISHEDPLAN

SHIPYARD AND SHIP'S NO. & NAME			
MITSUI TAMANO		MITSUBISHI KOBE	
NO.1323	DOCTOR LYKES	NO.1158	JAMES LYKES
NO.1324	ALMERIA LYKES	NO.1159	JOSEPH LYKES
NO.1325	TILLIE LYKES	NO.1164	SOLON TURMAN

MITSUI ENGINEERING & SHIPBUILDING CO.,LTD.
TAMANO WORKS

SHIP DESIGN DEPARTMENT — MANAGER
OUTFITTING DESIGN SECTION — SEC. CHIEF / ASSIST. CHIEF / CHARGE / STAFF
DATE: 0823 23 (TEL2245)

SHIP'S NO.: NO.1325
SHIP'S NAME: TILLIE LYKES

ARR. OF STAGE FOR CONTAINERS

JOB NO.: TS1323/24/25
SCALE: ~
LYKES REF. NO.: 270003
MITSUI DRAWING NO.: 4104340

(47 SHEETS WITH COVER)

PLAN RECORD

ALT. NO	MARK	ALTERATION/DESCRIPTION	DATE & SIGNATURE
1		PREPARED FOR S.NO. 1323 AS FINISHED PLAN, MADE APPLICABLE TO S.NO. 1324 AND S.NO. 1325.	NOVEMBER 20, 86

DWG. NO. 4104340

3/

GENERAL NOTE

PLEASE NOTE THAT THE STOWING ARRANGEMENT OF CONTAINER LOOSE FITTINGS (OFE) IS NOT SHOWN BECAUSE DETAIL DIMENSIONAL DRAWING OF LOOSE FITTING IS NOT RECEIVED FROM OWNER AS OF TODAY.

PLEASE SEND US THESE DRAWING URGENTLY TO PROCEED DETAIL DESIGN OF STOWING ARRANGEMENT.

IF YOU HAVE ANY COMMENTS TO THIS DRAWING, PLEASE INFORM US BY 23 AUG. 1985 BY FAX.

4/

符号 NO	名称 NAME	材料 MATERIAL	製造個数 QUANTITY	記事 REMARKS
R	HINGED STAGE	↑	1	
P	↑		1	
Q			1	
L			1	
K			1	
J			1	
I			1	
H			1	
G			1	
F			1	
E			1	
D			1	
C			1	
B			1	
A	PLATFORM	SS41	1	
13	↑	↑	2	↑
12			2	
11			2	
10			2	
9			2	
8			2	
7			6	
6			2	
5			4	
4			2	
3			2	
2			2	
1	STAGE	SS41 SGP	2	半数対称

製造個数は 1 隻 分を示す 上記（1隻分） 3 隻分製造のこと。

STAGE & PLATFORM

尺度 SCALE | TSO. | DR. NO. | PAGE

1037

符号 NO.	名称 NAME	材料 MATERIAL	試験片 TEST PIECE	常備 USE	予備 SPARE	合計 TOTAL	関係工場 WORK SHOP	1個 ONE	合計 TOTAL	記事 REMARKS
S4	↑	↑				4				
S3						10				
S2						12				
S1	SEET	SS41				20				
Y2	JUMPING STOPPER	SS41				40				(S4)(X2)付
Y1	JUMPING STOPPER	SS41				42				(S3)(X1)付
-5	↑	↑				5				
-4						5				
-3						(8)				
-2						5				
CP-1	COVER PL	SS41								
a	STEP					40				
-6	↑	↑		R-2 L-2		6				
-5				R-9 L-9		18				
-4				R-1 L-1		2				
-3				R-2 L-2		4				
-2				R-3 L-3		6				
DL-1	DK. LADDER	SS41 PAD(P-AAS)		R-7 L-7		14				
VL-10	VERTICAL LADDER	SS41 PAD(P-AAS)				6				
-9	↑	↑				1				
-8				P-1 S-1		2				
-7				P-1 S-1		2				
-6				P-1 S-1		2				
-5				S-1		1				
-4				P-1		1				
-3				S-1		1				
-2		-		P-4 S-1		5				
VL-1	VERTICAL LADDER	SS41 PAD(P-AAS)				4				

製造個数 QUANTITY; 重量(kg) WEIGHT

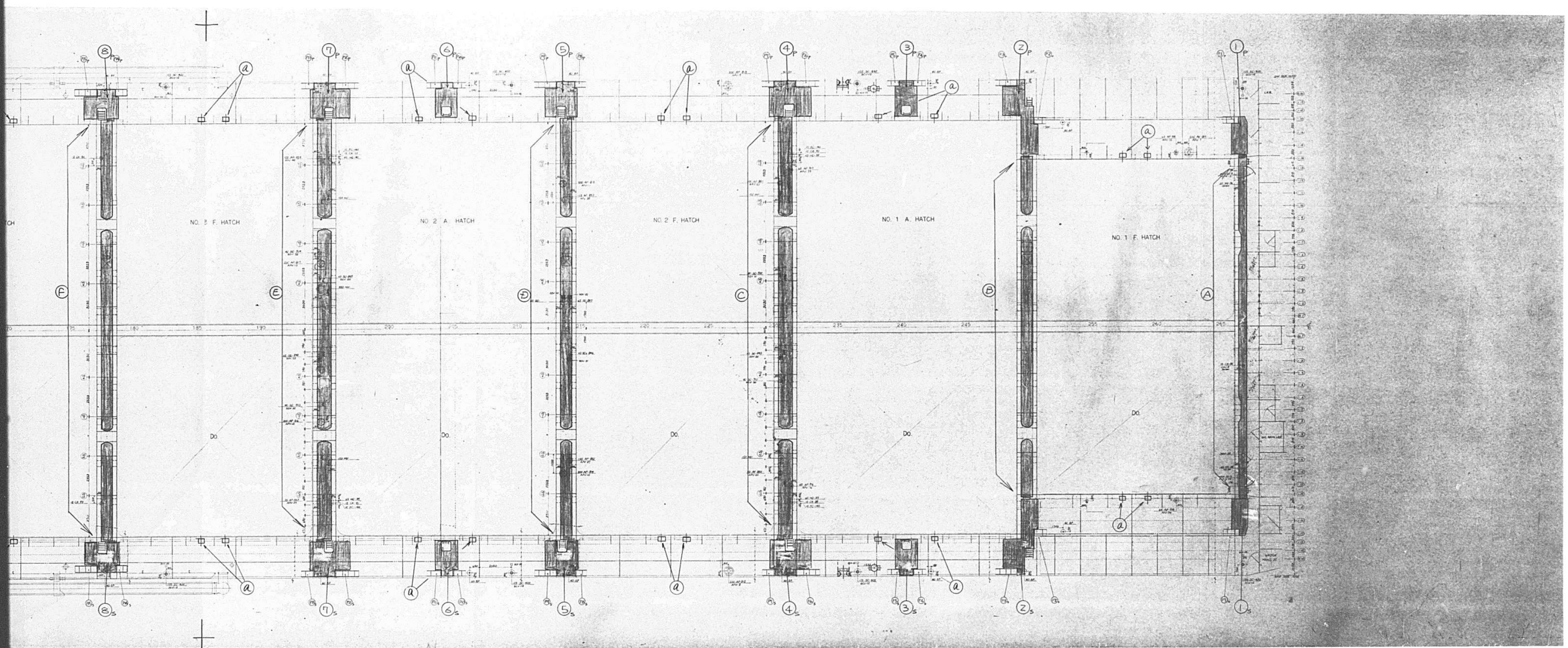
製造個数は 1隻 分を示す　上記（1隻分）3隻分製造のこと。

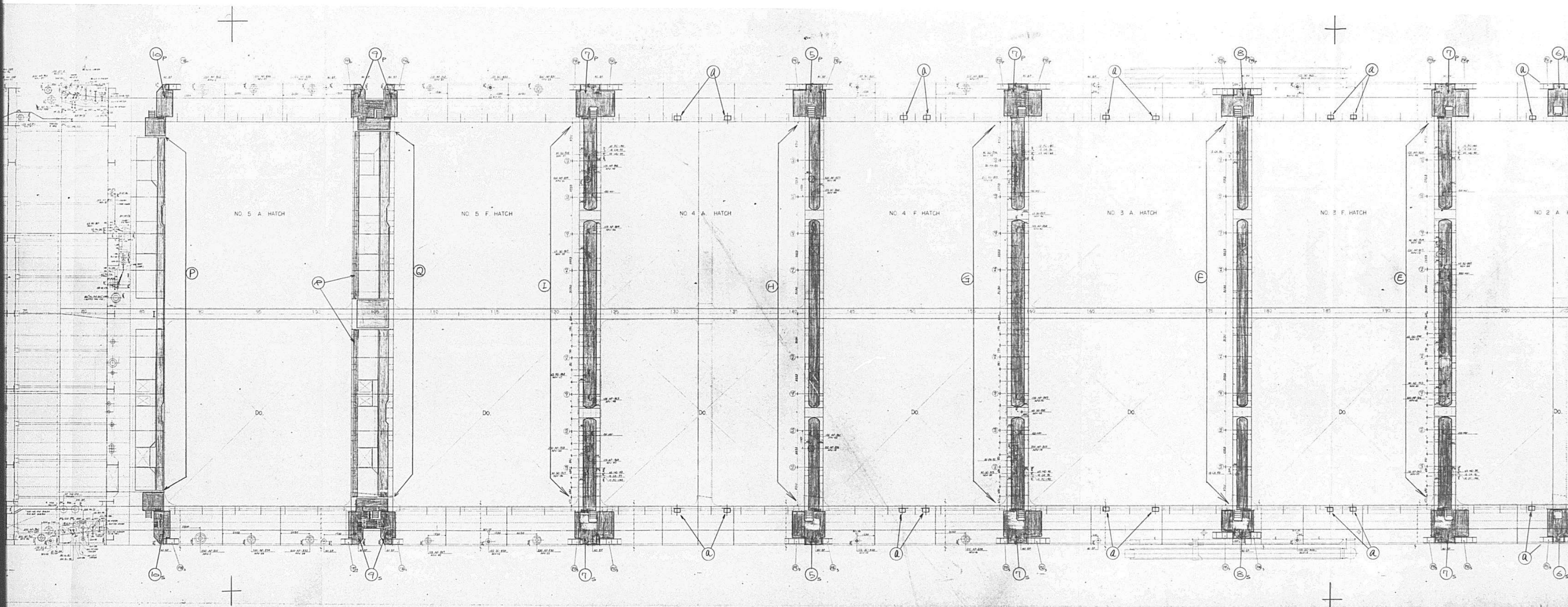
FITTINGS

尺度 SCALE

61131—3設—工.A4.ト 200.48.1.TH

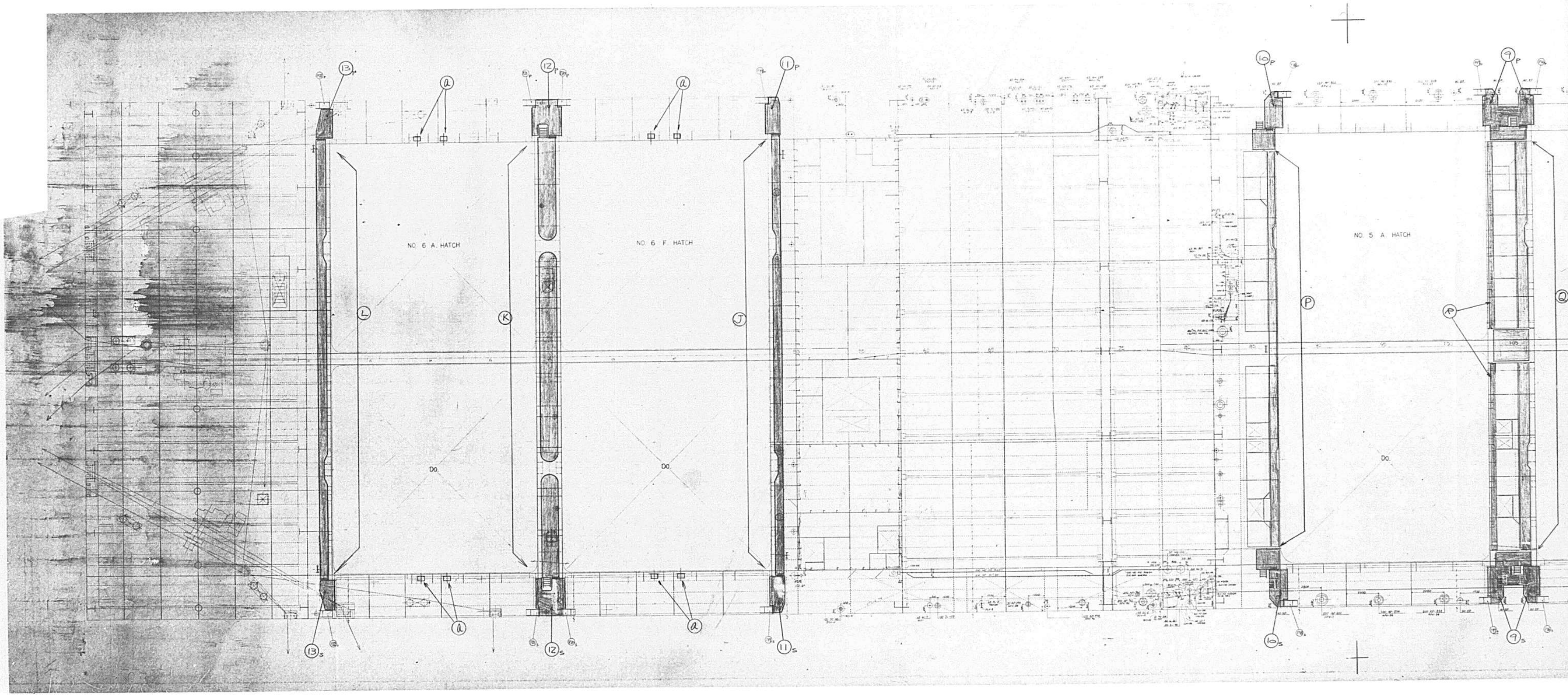
TSO. 1323/45　DR. NO. 4104340M　PAGE 3/6


NO. 3 F. HATCH
NO. 2 A. HATCH
NO. 2 F. HATCH
NO. 1 A. HATCH
NO. 1 F. HATCH
DO.

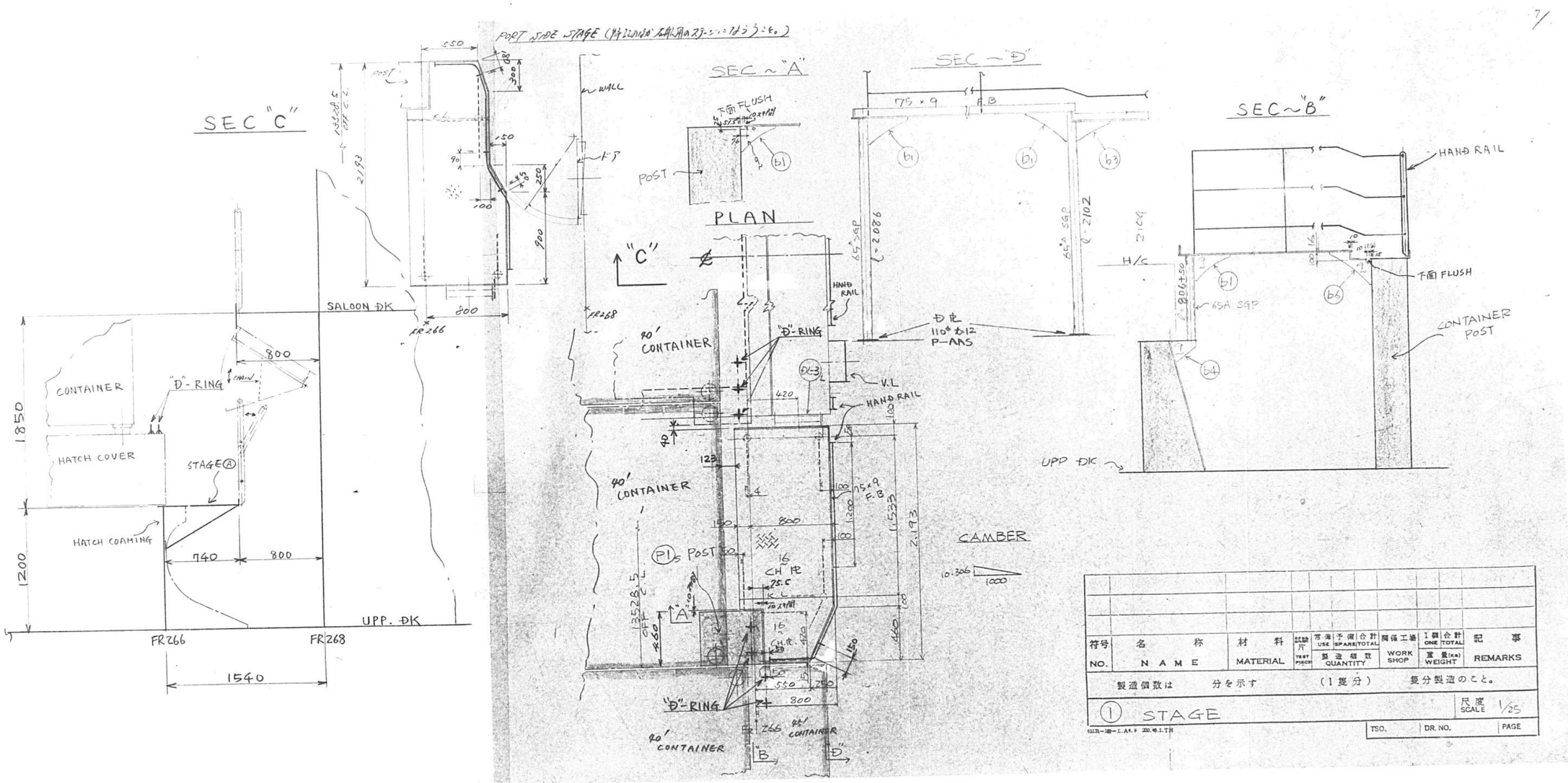


NO. 5 A. HATCH
NO. 5 F. HATCH
NO. 4 A. HATCH
NO. 4 F. HATCH
NO. 3 A. HATCH
NO. 3 F. HATCH
NO. 2 A. HATCH

2/3 1040

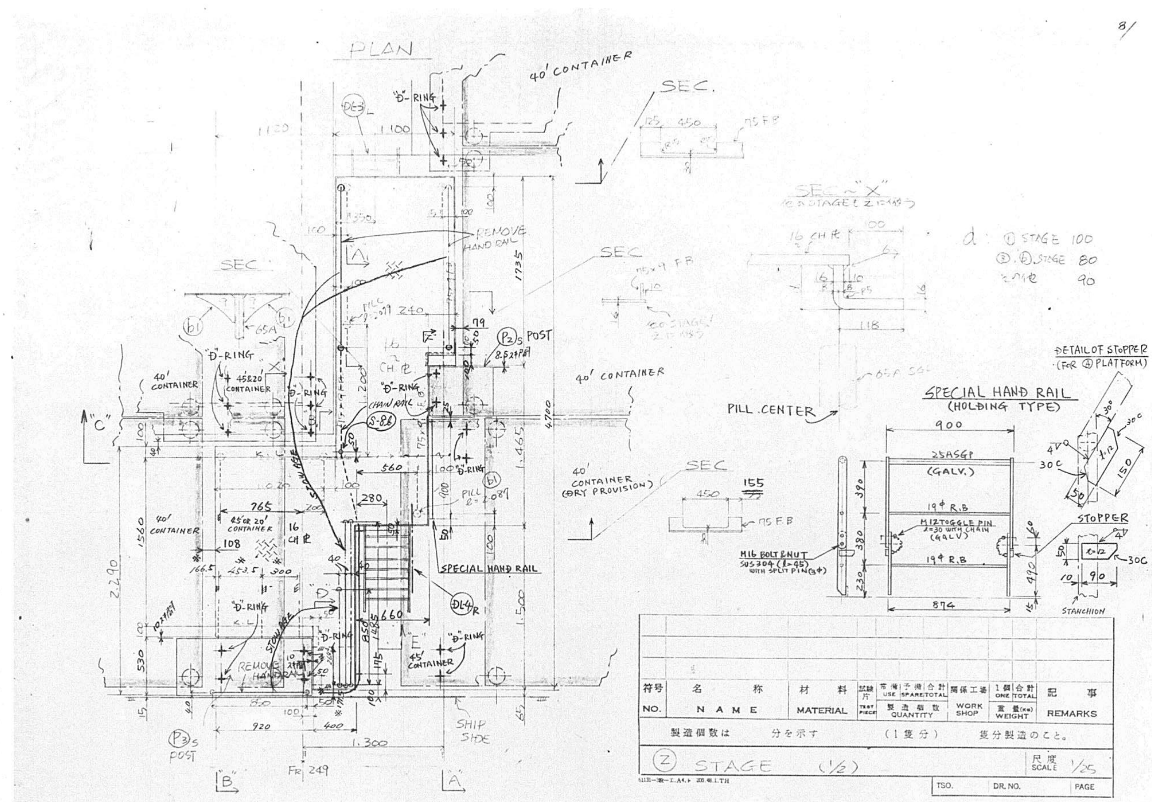


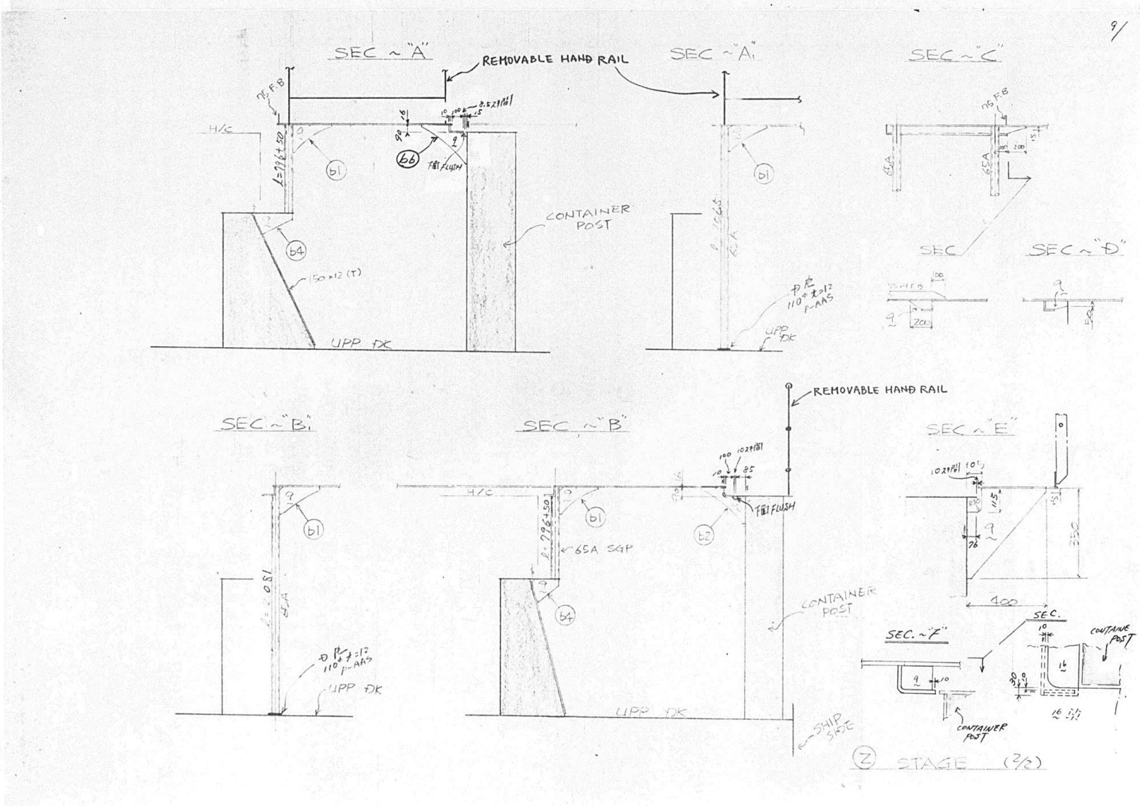
3/3 1041



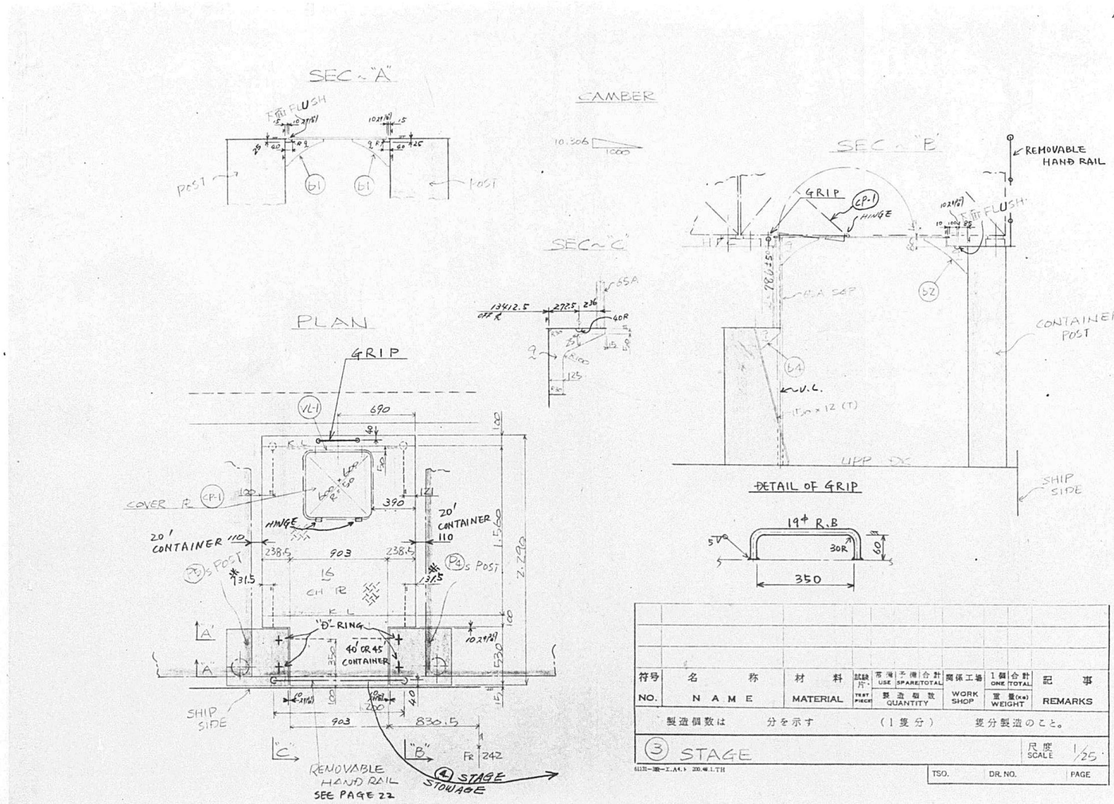
SEC "C"
CONTAINER
"D"-RING
HATCH COVER
STAGE Ⓐ
HATCH COAMING
SALOON DK
UPP. DK
FR266
FR268
1540
1850
1200
740
800
PORT SIDE STAGE
SEC~"A"
POST
PLAN
"C"
40' CONTAINER
"D"-RING
HAND RAIL
V.L
P1 POST
CH
550
800
266
40' CONTAINER
B
D
SEC~"D"
75×9
F.B
65A SGP
ℓ=2086
ℓ=2102
P-ARS
CAMBER
SEC~"B"
HAND RAIL
下面 FLUSH
CONTAINER POST
UPP DK
H/C
符号 NO.
名称 NAME
材料 MATERIAL
WORK SHOP
WEIGHT
記事 REMARKS
製造個数は 分を示す (1隻分) 隻分製造のこと。
① STAGE
尺度 SCALE 1/25

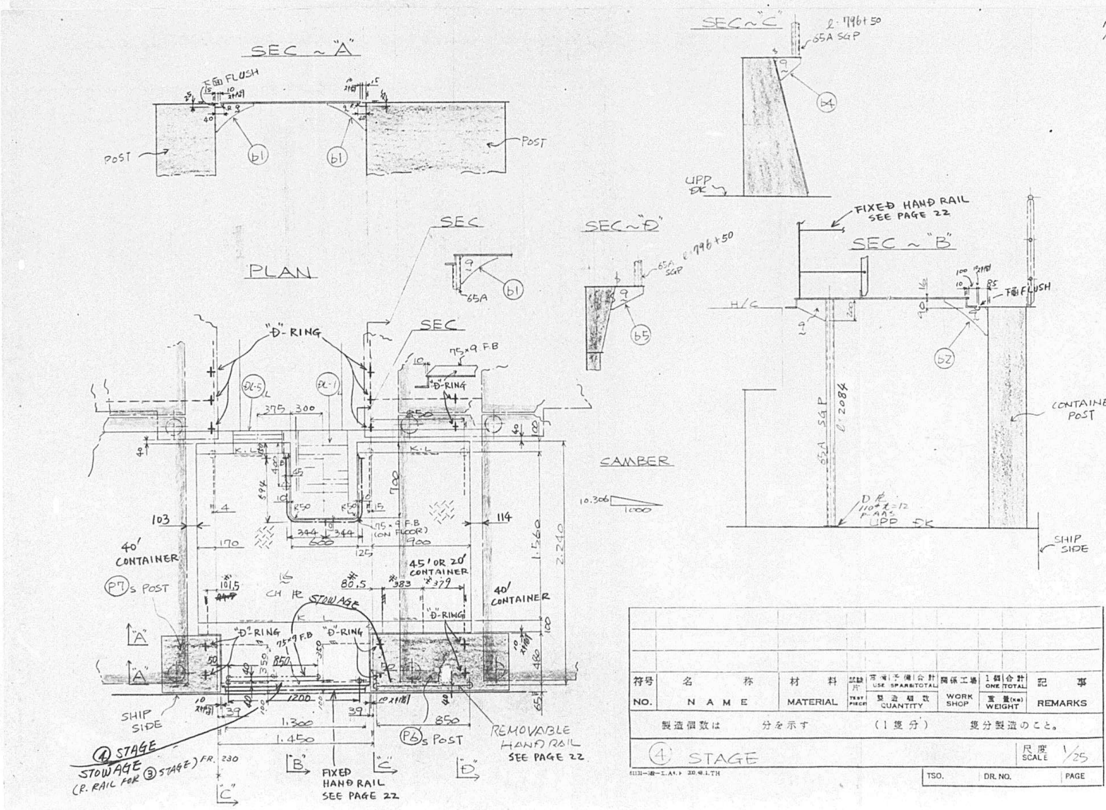
1042


PLAN
40' CONTAINER
SEC.
"D"-RING
REMOVE HAND RAIL
SEC~"X"
SPECIAL HAND RAIL
(HOLDING TYPE)
DETAIL OF STOPPER
(FOR ② PLATFORM)
STOPPER
STANCHION
PILL CENTER
40' CONTAINER (DRY PROVISION)
M16 BOLT & NUT
SUS304 (ℓ=45)
WITH SPLIT PIN (3φ)
M12 TOGGLE PIN
ℓ=30 WITH CHAIN
(GALV.)
25A SGP
(GALV.)
19φ R.B
POST
SPECIAL HAND RAIL
SHIP SIDE
CHAIN RAIL
FR 249
符号 NO.
名称 NAME
材料 MATERIAL
製造個数は 分を示す (1隻分) 要分製造のこと。
STAGE (1/2)
尺度 SCALE 1/25
TSO.
DR. NO.
PAGE
記事 REMARKS
WORK SHOP
QUANTITY
WEIGHT
8/

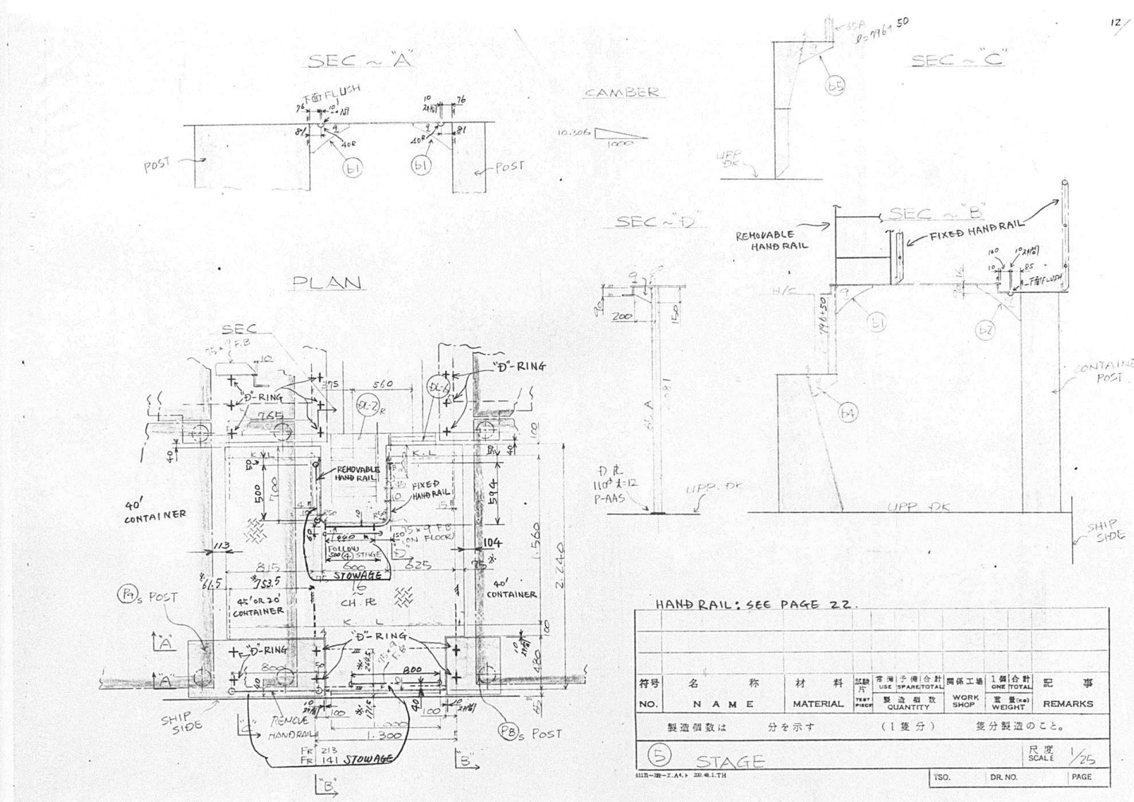

SEC~"A"
REMOVABLE HAND RAIL
SEC~"A'"
SEC~"C"
CONTAINER POST
UPP DK
SEC
SEC~"D"
SEC~"B'"
SEC~"B"
SEC~"E"
SEC~"F"
SEC.
65A SGP
CONTAINER POST
SHIP SIDE
STAGE (2/2)
9/

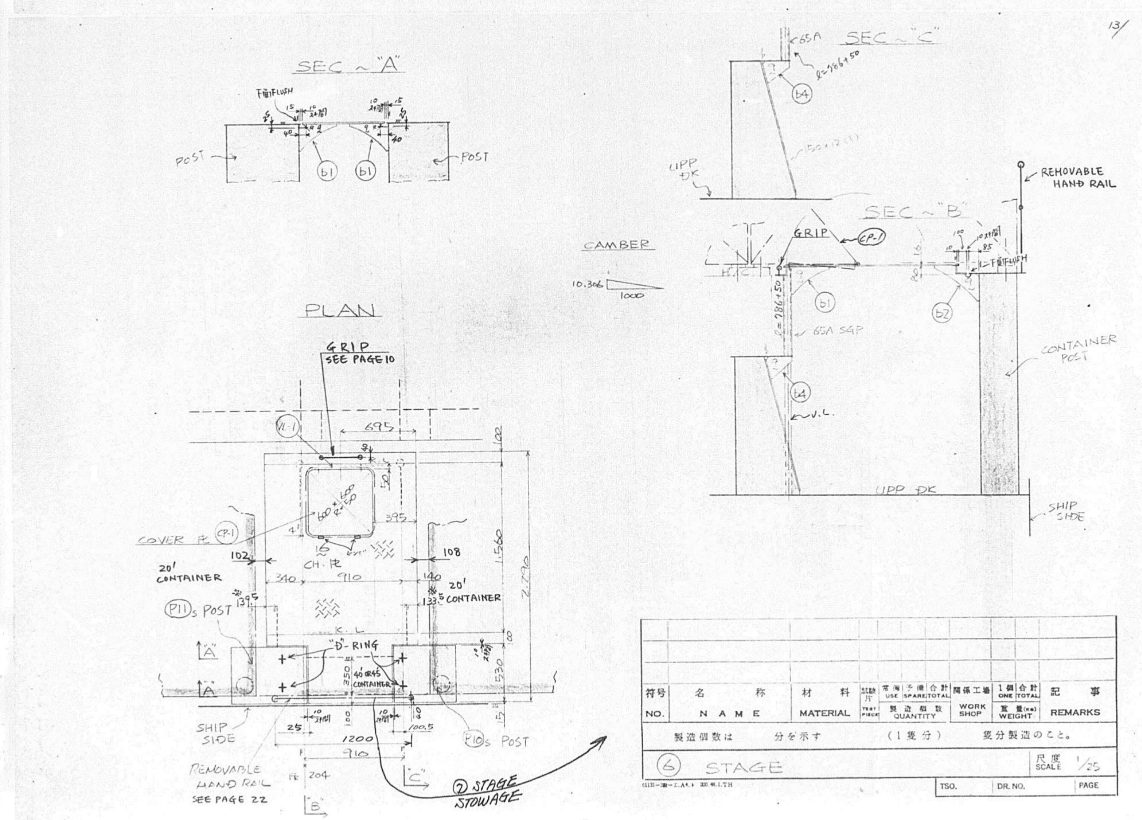
1043


10
SEC~"A"
CAMBER
SEC~"B"
REMOVABLE HAND RAIL
GRIP
HINGE
SEC~"C"
PLAN
CONTAINER POST
SHIP SIDE
DETAIL OF GRIP
19φ R.B
350
20' CONTAINER
40' OR 45' CONTAINER
"D"-RING
POST
REMOVABLE HAND RAIL SEE PAGE 22
④ STAGE STOWAGE
符号 NO.
名称 NAME
材料 MATERIAL
記事 REMARKS
製造個数は 分を示す
(1隻分)
③ STAGE
尺度 SCALE 1/25

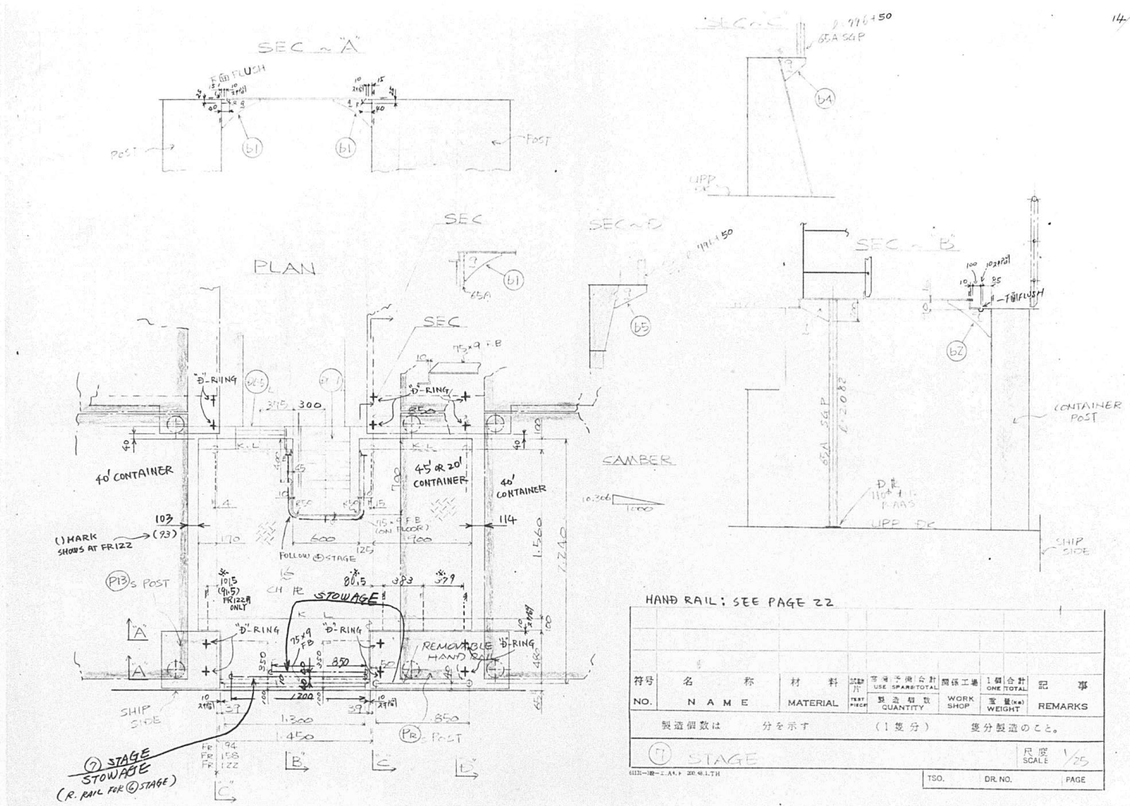
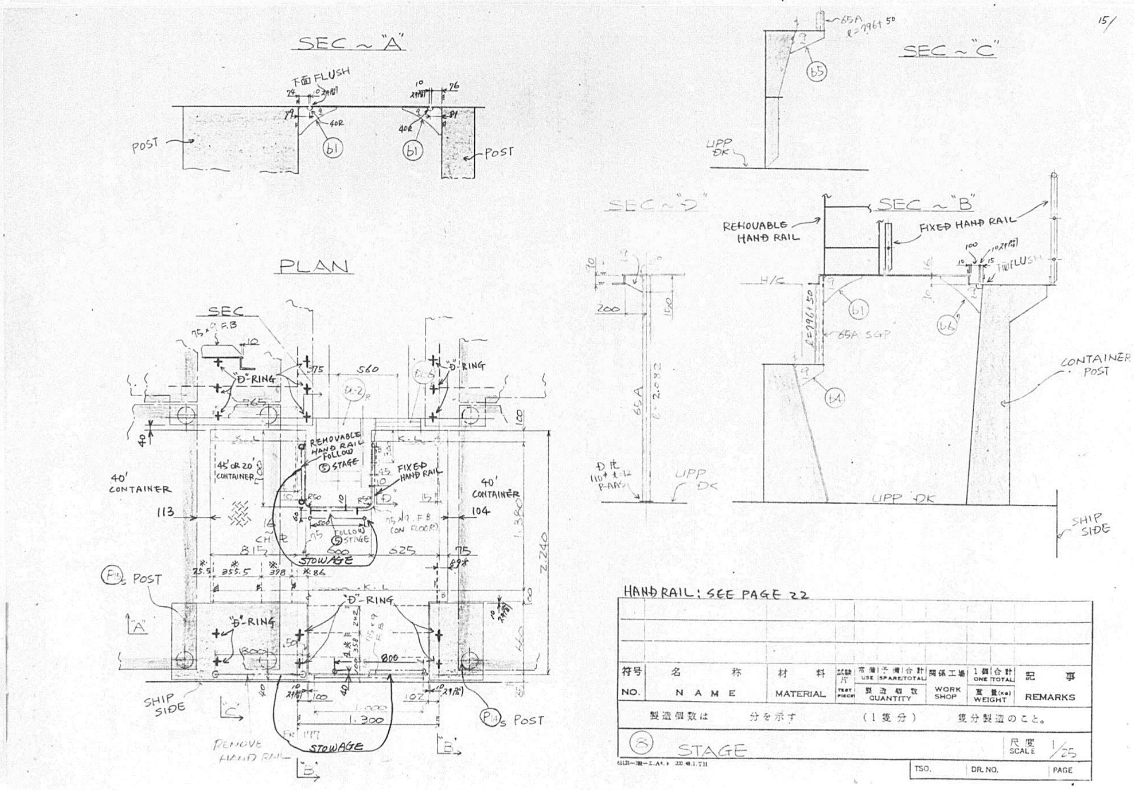

11
SEC~"A"
SEC~"C"
FIXED HAND RAIL SEE PAGE 22
SEC~"D"
SEC~"B"
PLAN
SEC
"D"-RING
CAMBER
40' CONTAINER
45' OR 20' CONTAINER
CONTAINER POST
SHIP SIDE
④ STAGE STOWAGE (R. RAIL FOR ③ STAGE)
FIXED HAND RAIL SEE PAGE 22
REMOVABLE HAND RAIL SEE PAGE 22
符号 NO.
名称 NAME
材料 MATERIAL
記事 REMARKS
製造個数は 分を示す
(1隻分)
④ STAGE
尺度 SCALE 1/25

1044

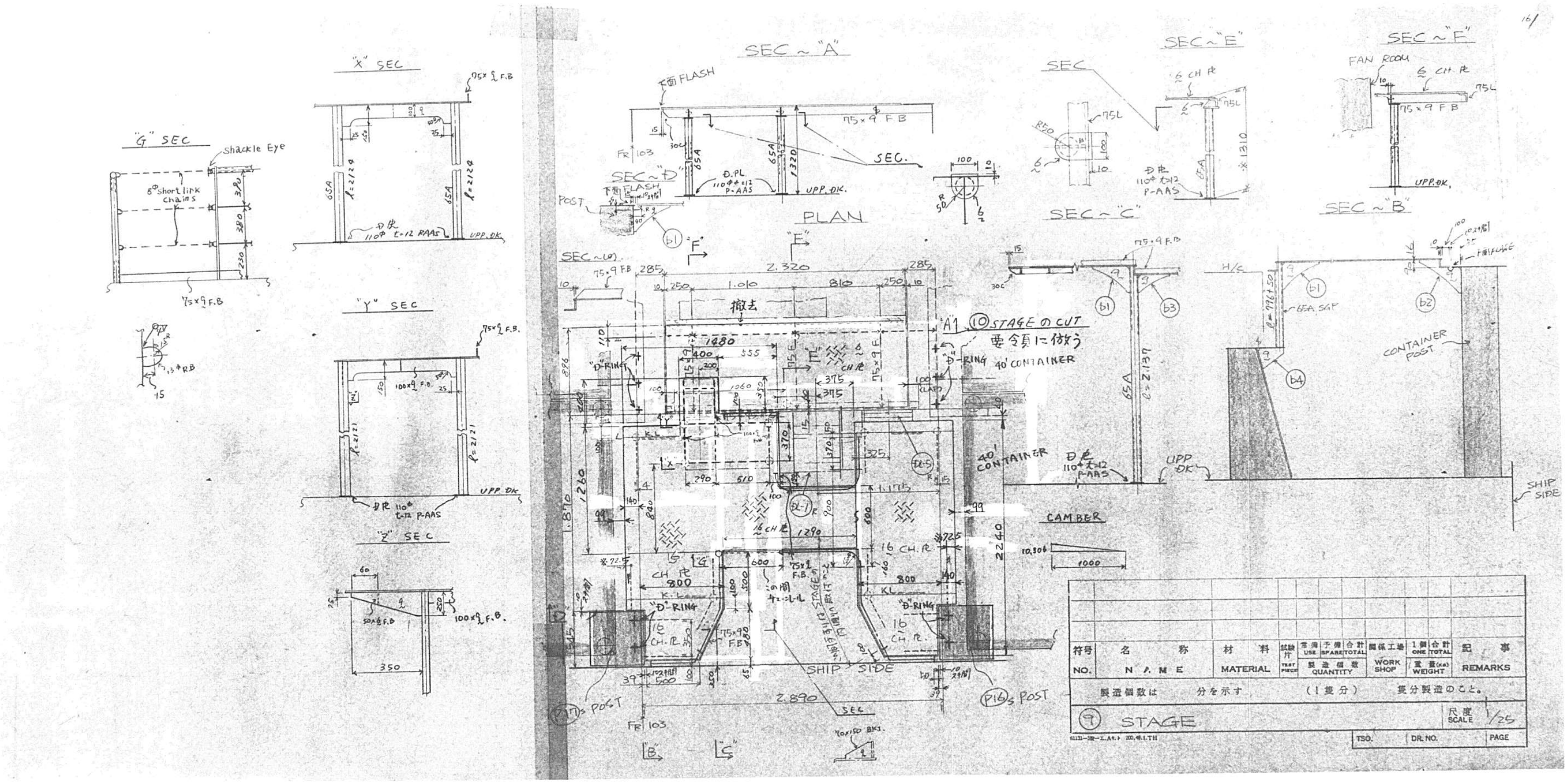

12/
SEC ~ "A"
POST
CAMBER
10.306
1000
SEC ~ "C"
UPP DK
SEC ~ "D"
SEC ~ "B"
REMOVABLE HAND RAIL
FIXED HAND RAIL
CONTAINER POST
UPP DK
SHIP SIDE
PLAN
SEC
"D"-RING
40' CONTAINER
REMOVABLE HAND RAIL
FIXED HAND RAIL
STOWAGE
CH PL
40' CONTAINER
40' OR 20' CONTAINER
P9s POST
P8s POST
SHIP SIDE
REMOVE HANDRAIL
FR 213
FR 141 STOWAGE
HAND RAIL: SEE PAGE 22.
符号 NO.
名称 NAME
材料 MATERIAL
製造個数 QUANTITY
関係工場 WORK SHOP
重量 WEIGHT
記事 REMARKS
製造個数は 分を示す (1隻分) 隻分製造のこと。
5 STAGE
尺度 SCALE 1/25
TSO.
DR. NO.
PAGE


13/
SEC ~ "A"
POST
SEC ~ "C"
UPP DK
REMOVABLE HAND RAIL
SEC ~ "B"
GRIP
CAMBER
10.306
1000
CONTAINER POST
UPP DK
SHIP SIDE
PLAN
GRIP SEE PAGE 10
COVER PL
20' CONTAINER
CH PL
20' CONTAINER
P11s POST
"D"-RING
40' OR 45' CONTAINER
SHIP SIDE
P10s POST
REMOVABLE HAND RAIL SEE PAGE 22
② STAGE STOWAGE
符号 NO.
名称 NAME
材料 MATERIAL
製造個数 QUANTITY
関係工場 WORK SHOP
重量 WEIGHT
記事 REMARKS
製造個数は 分を示す (1隻分) 隻分製造のこと。
6 STAGE
尺度 SCALE 1/25
TSO.
DR. NO.
PAGE

1045

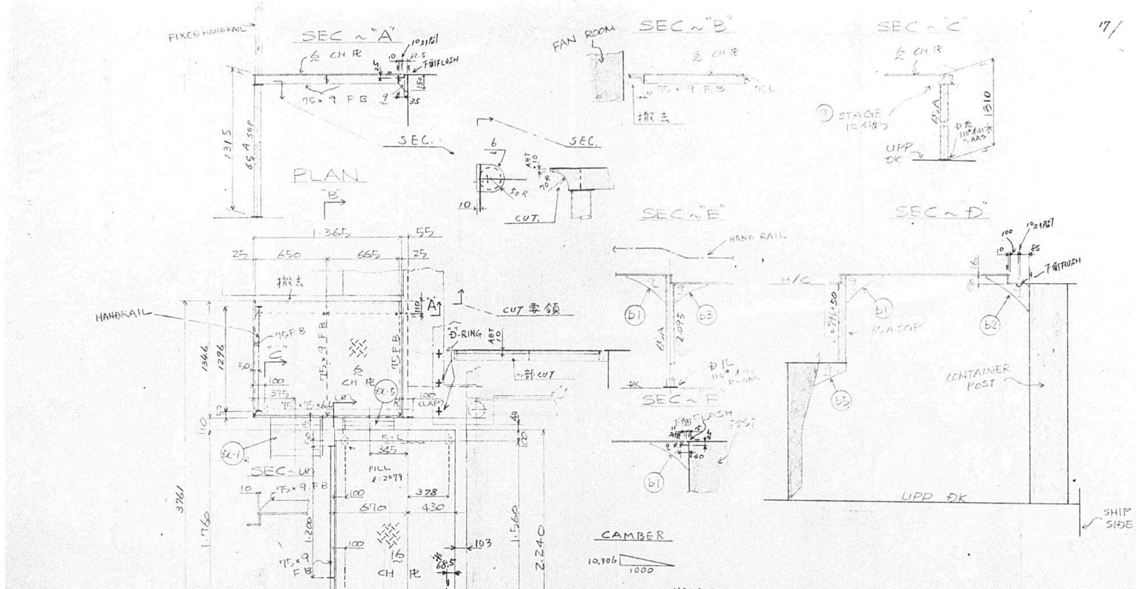

14
SEC~"A"
F面 FLUSH
POST
SEC~"D"
SEC~"B"
SEC
PLAN
65A SGP
UPP DK
CONTAINER POST
SHIP SIDE
CAMBER
"D"-RING
40' CONTAINER
45' or 20' CONTAINER
40' CONTAINER
( ) MARK SHOWS AT FR122
P13's POST
STOWAGE
REMOVABLE HAND RAIL
FOLLOW ⑥ STAGE
⑦ STAGE STOWAGE
(R. RAIL FOR ⑥ STAGE)
Pr's POST
HAND RAIL: SEE PAGE 22
符号 NO. | 名称 NAME | 材料 MATERIAL | 試験片 TEST PIECE | 常備 予備 合計 USE SPARE TOTAL 製造個数 QUANTITY | 関係工場 WORK SHOP | 1個 合計 ONE TOTAL 重量(kg) WEIGHT | 記事 REMARKS
製造個数は 分を示す (1隻分) 隻分製造のこと。
⑦ STAGE
尺度 SCALE 1/25
TSO. DR. NO. PAGE

15
SEC~"A"
F面 FLUSH
POST
SEC~"C"
SEC~"D"
SEC~"B"
REMOVABLE HAND RAIL
FIXED HAND RAIL
65A SGP
UPP DK
CONTAINER POST
SHIP SIDE
PLAN
SEC
"D"-RING
40' CONTAINER
45' or 20' CONTAINER
REMOVABLE HAND RAIL FOLLOW ⑤ STAGE
FIXED HAND RAIL
STOWAGE
P1's POST
REMOVE HAND RAIL
HAND RAIL: SEE PAGE 22
符号 NO. | 名称 NAME | 材料 MATERIAL | 試験片 TEST PIECE | 常備 予備 合計 USE SPARE TOTAL 製造個数 QUANTITY | 関係工場 WORK SHOP | 1個 合計 ONE TOTAL 重量(kg) WEIGHT | 記事 REMARKS
製造個数は 分を示す (1隻分) 隻分製造のこと。
⑧ STAGE
尺度 SCALE 1/25
TSO. DR. NO. PAGE

1046


"G" SEC
Shackle Eye
"X" SEC
"Y" SEC
"Z" SEC
SEC~"A"
SEC~"E"
SEC~"F"
FAN ROOM
SEC~"D"
PLAN
SEC~"C"
SEC~"B"
UPP. DK.
⑩ STAGE の CUT
要領に倣う
40' CONTAINER
CONTAINER POST
"D"-RING
CAMBER
SHIP SIDE
P16's POST
符号 NO.
名 称 NAME
材 料 MATERIAL
製造個数 QUANTITY
WORK SHOP
重量 WEIGHT
記 事 REMARKS
⑨ STAGE
尺度 SCALE 1/25
PAGE

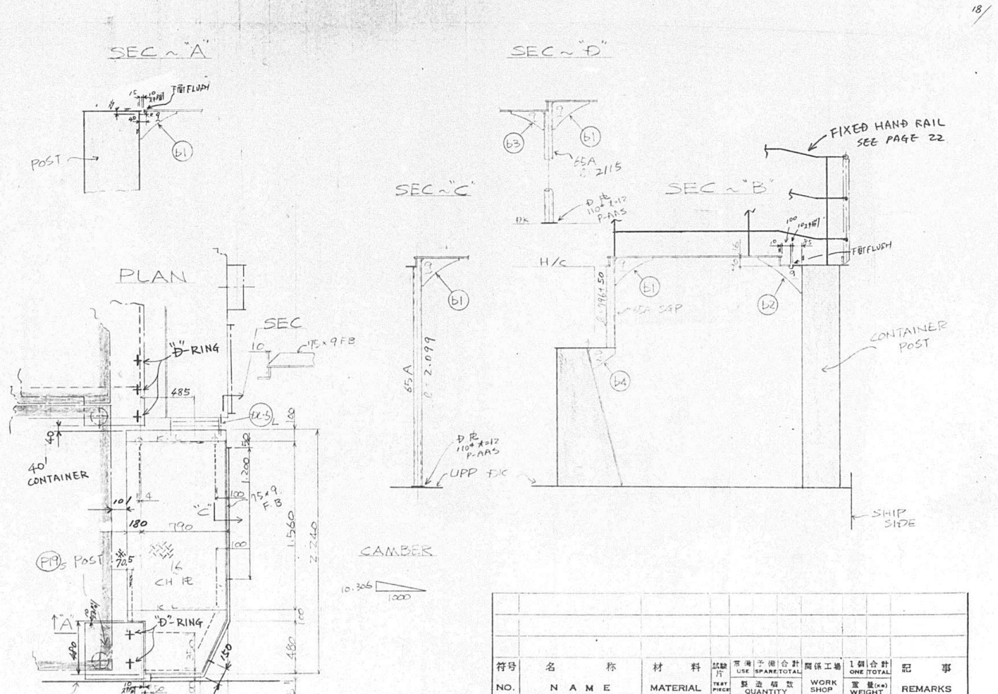
1047

17/



符号 NO.	名称 NAME	材料 MATERIAL	試験片 TEST PIECE	常備 USE / 予備 SPARE / 合計 TOTAL 製造個数 QUANTITY	関係工場 WORK SHOP	1個 ONE / 合計 TOTAL 重量(kg) WEIGHT	記事 REMARKS
製造個数は		分を示す		(1隻分)	隻分製造のこと。		
⑩	STAGE					尺度 SCALE 1/25	
				TSO.	DR. NO.		PAGE

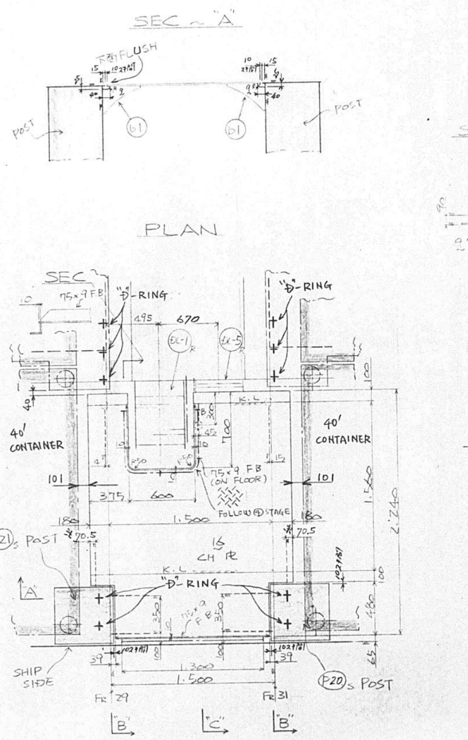
18/

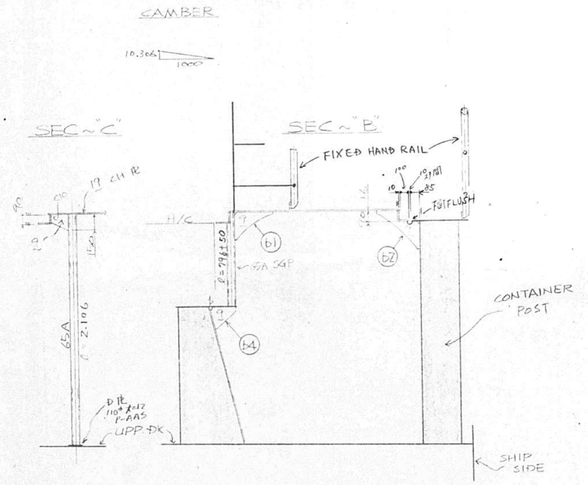


符号 NO.	名称 NAME	材料 MATERIAL	試験片 TEST PIECE	常備 USE / 予備 SPARE / 合計 TOTAL 製造個数 QUANTITY	関係工場 WORK SHOP	1個 ONE / 合計 TOTAL 重量(kg) WEIGHT	記事 REMARKS
製造個数は		分を示す		(1隻分)	隻分製造のこと。		
⑪	STAGE					尺度 SCALE 1/25	
				TSO.	DR. NO.		PAGE

1048

19/





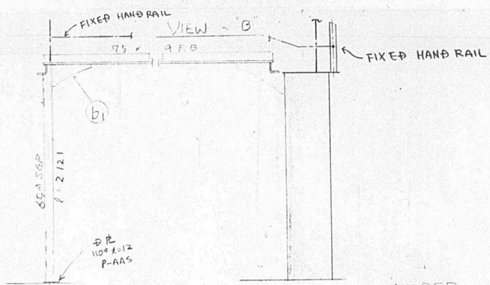
符号 NO.	名 称 N A M E	材 料 MATERIAL	試験片 TEST PIECE	常備 USE	予備 SPARE	合計 TOTAL	関係工場 WORK SHOP	1個 ONE	合計 TOTAL	記 事 REMARKS

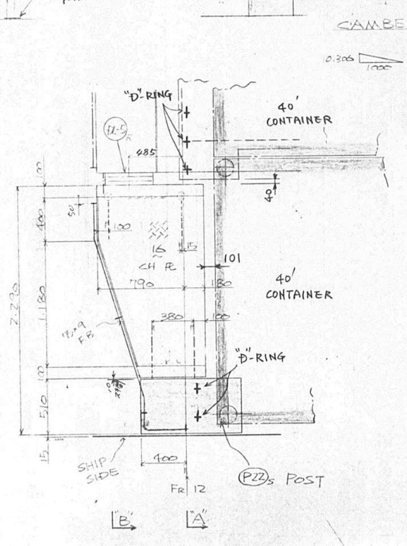
製造個数は 分を示す （1 隻 分） 隻分製造のこと。

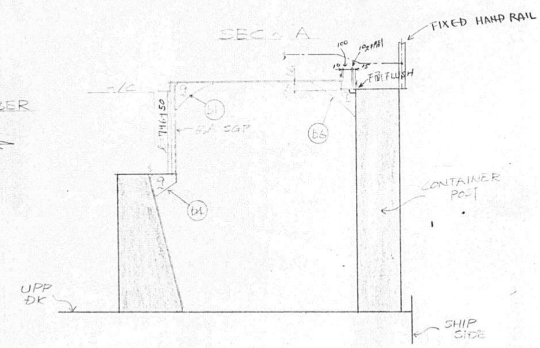
⑫ STAGE 尺度 SCALE 1/20

TSO. DR. NO. PAGE

20/







HAND RAIL: SEE PAGE 22

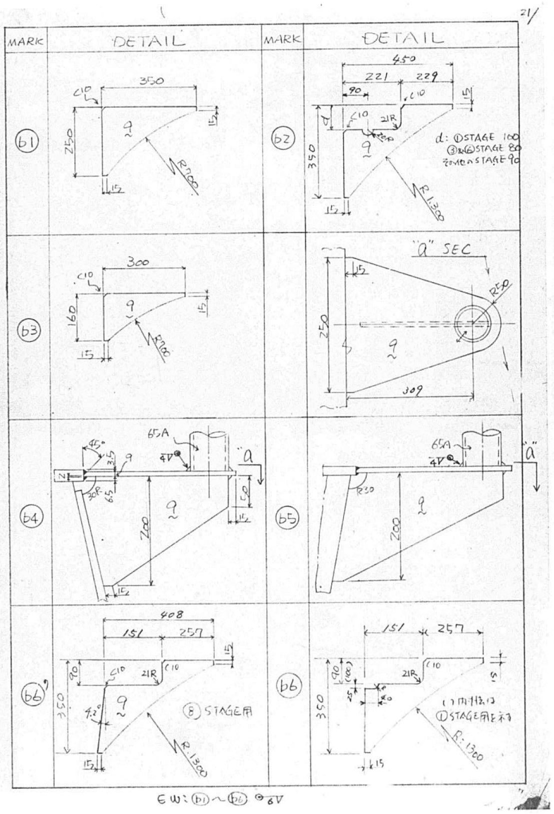
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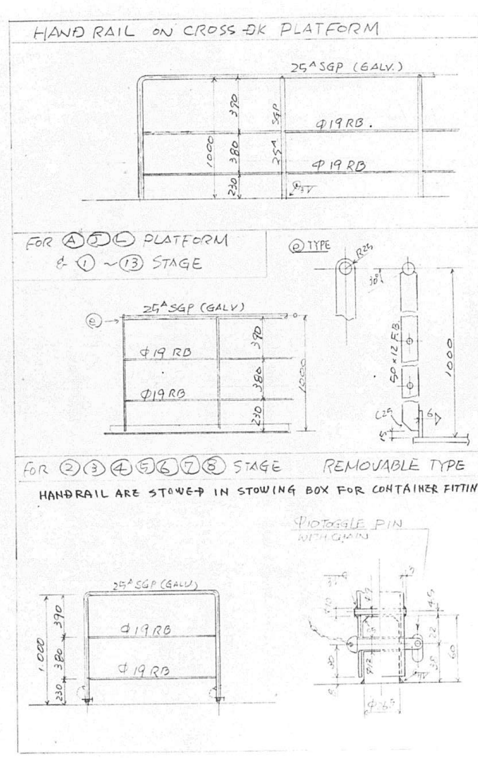
製造個数は 分を示す （1 隻 分） 隻分製造のこと。

⑬ STAGE 尺度 SCALE 1/25

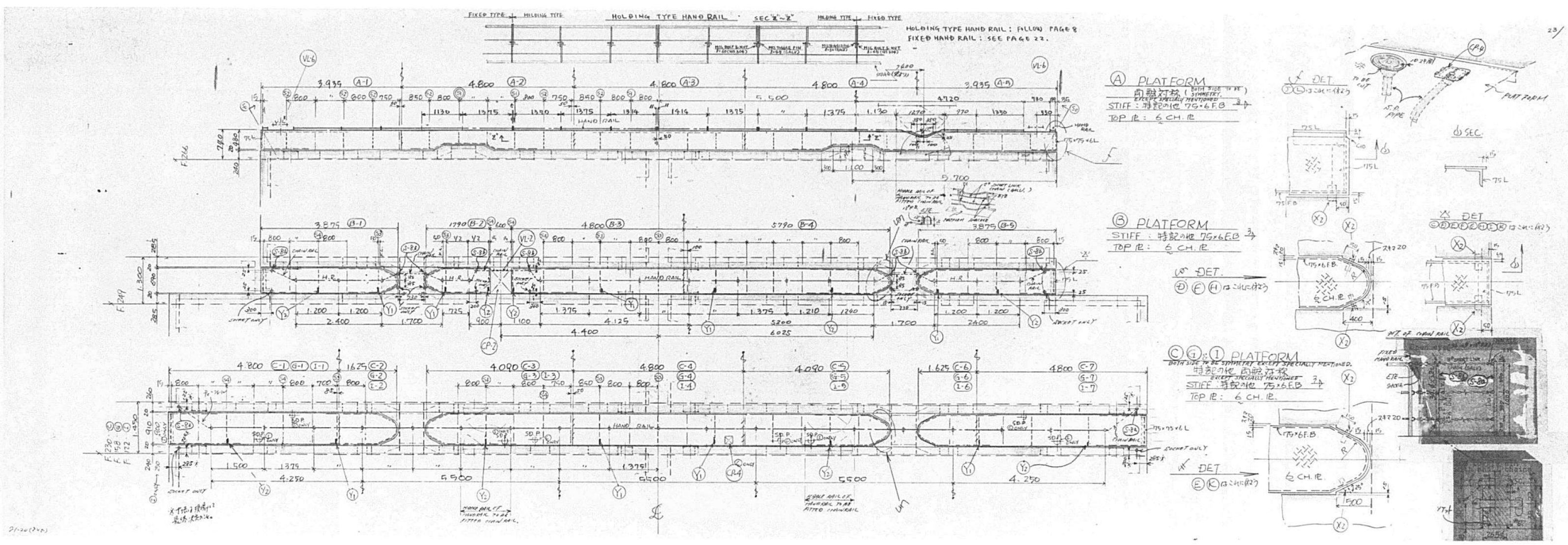
TSO. DR. NO. PAGE

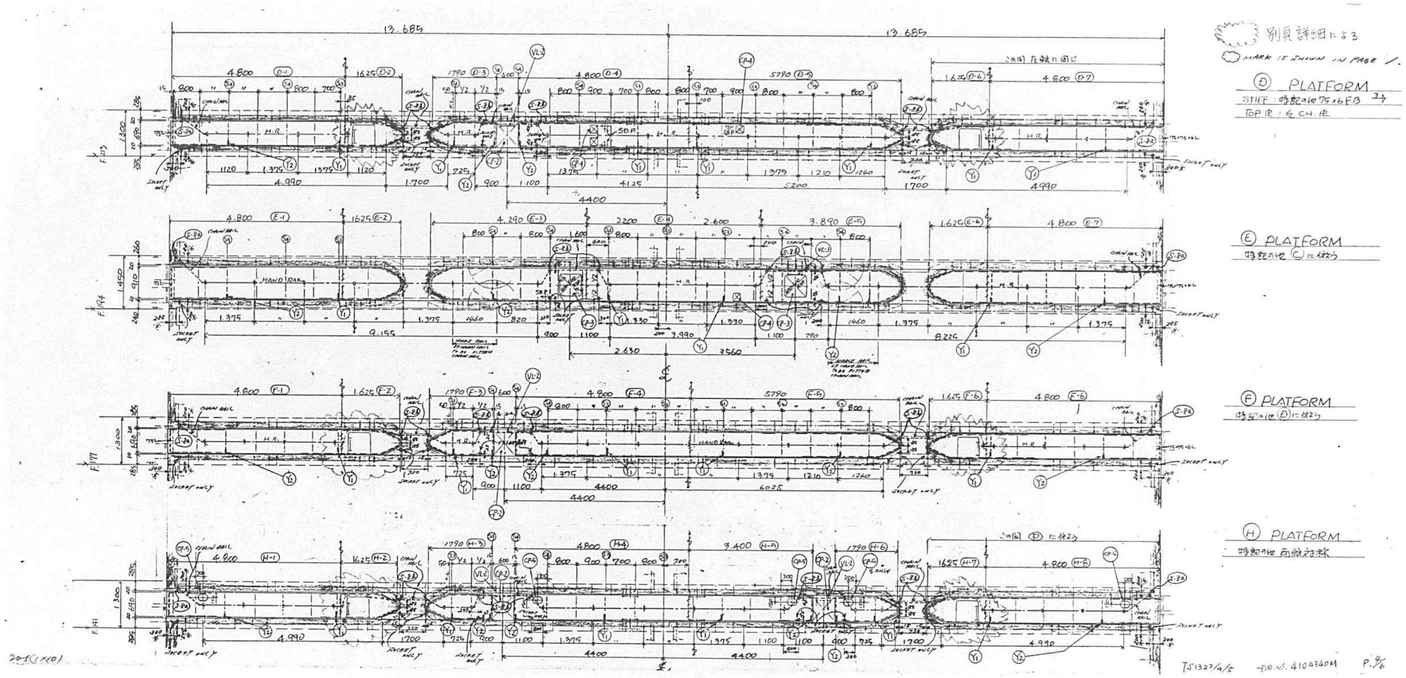
1049


21/
MARK
DETAIL
MARK
DETAIL
b1
b2
b3
b4
b5
b6
"a" SEC
d: ①STAGE 100
ⓑ STAGE 90
65A
R1300


22/
HAND RAIL ON CROSS-DK PLATFORM
25A SGP (GALV.)
Φ19 RB.
Φ19 RB
FOR Ⓐ Ⓙ Ⓛ PLATFORM
& ① ~ ⑬ STAGE
ⓔ TYPE
25A SGP (GALV)
Φ19 RB
50×12 FB
FOR ② ③ ④ ⑤ ⑥ ⑦ ⑧ STAGE REMOVABLE TYPE
HANDRAIL ARE STOWED IN STOWING BOX FOR CONTAINER FITTINGS.
TOGGLE PIN
25A SGP (GALV)

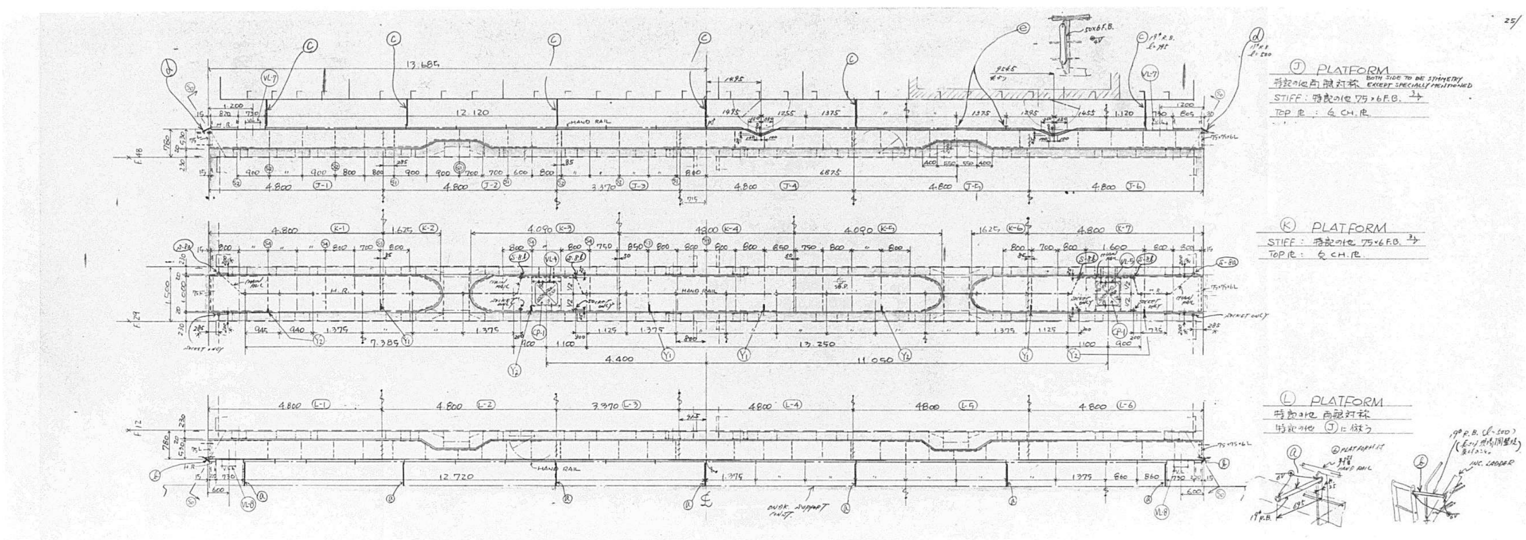
1050


HOLDING TYPE HAND RAIL
A PLATFORM
B PLATFORM
PLATFORM



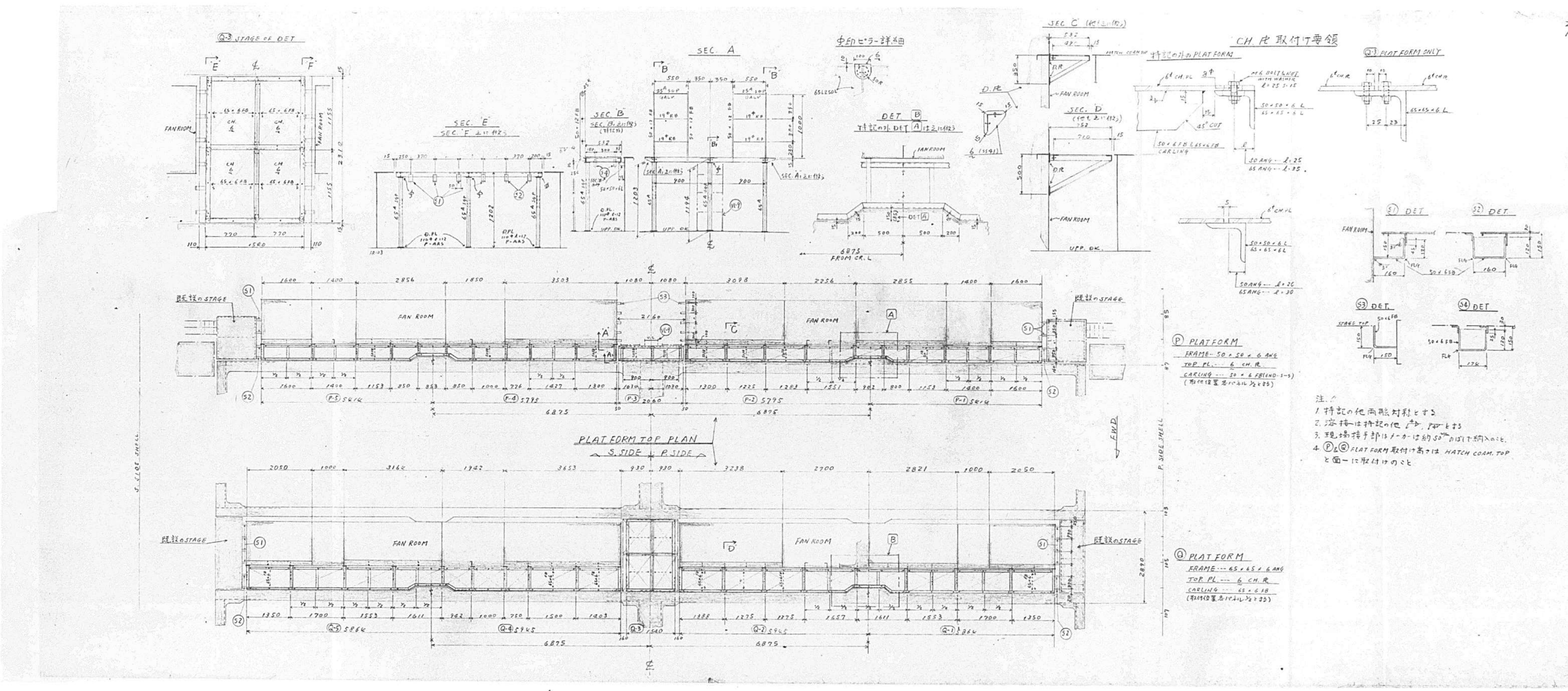
別頁詳細による
MARK IS SHOWN IN PAGE 1.
Ⓓ PLATFORM
Ⓔ PLATFORM
Ⓕ PLATFORM
Ⓗ PLATFORM

1052

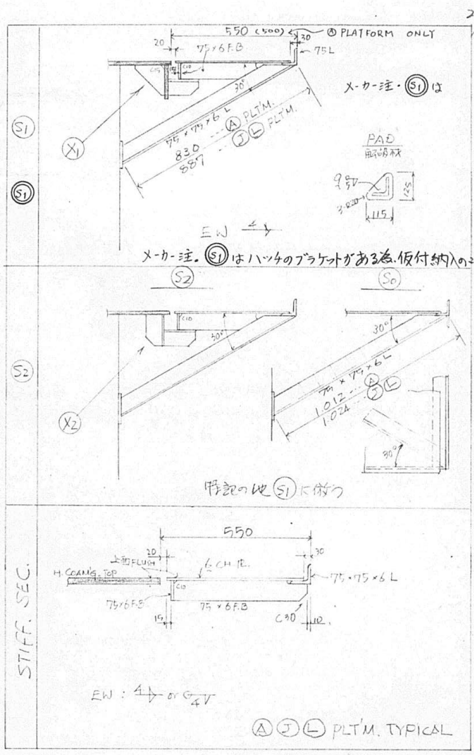


25/
(J) PLATFORM
特記の他両舷対称 BOTH SIDE TO BE SYMMETRY EXCEPT SPECIALLY MENTIONED
STIFF : 特記の他 75×6F.B.
(K) PLATFORM
STIFF : 特記の他 75×6F.B.
(L) PLATFORM
特記の他 両舷対称
特記の他 (J) に做う
INC. LADDER
HAND RAIL

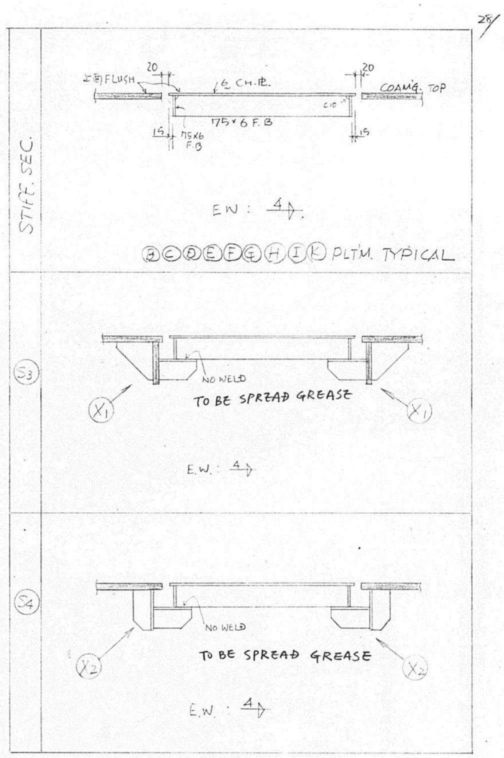
1053


SEC. A
SEC. B
SEC. C
SEC. D
SEC. E
FAN ROOM
PLATFORM TOP PLAN
S. SIDE
P. SIDE
PLATFORM
FWD

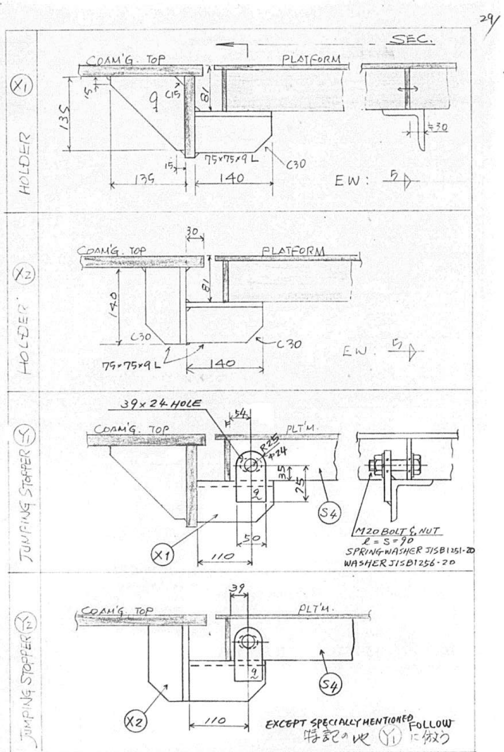
27/


STIFF. SEC.
550 (500) ① PLATFORM ONLY
75×6 F.B
75 L
75×75×6 L
830 … Ⓐ PLT'M.
887 … ⒿⓁ PLT'M.
メーカー注・Ⓢ1は
PAD
EW
メーカー注. Ⓢ1はハッチのブラケットがある為.仮付納入のこと
特記の他 Ⓢ1 に依う
550
上面FLUSH
H.COAM'G. TOP
6 CH. PL.
75×75×6 L
75×6 F.B
C30
EW : 4 or 4
ⒶⒿⓁ PLT'M. TYPICAL

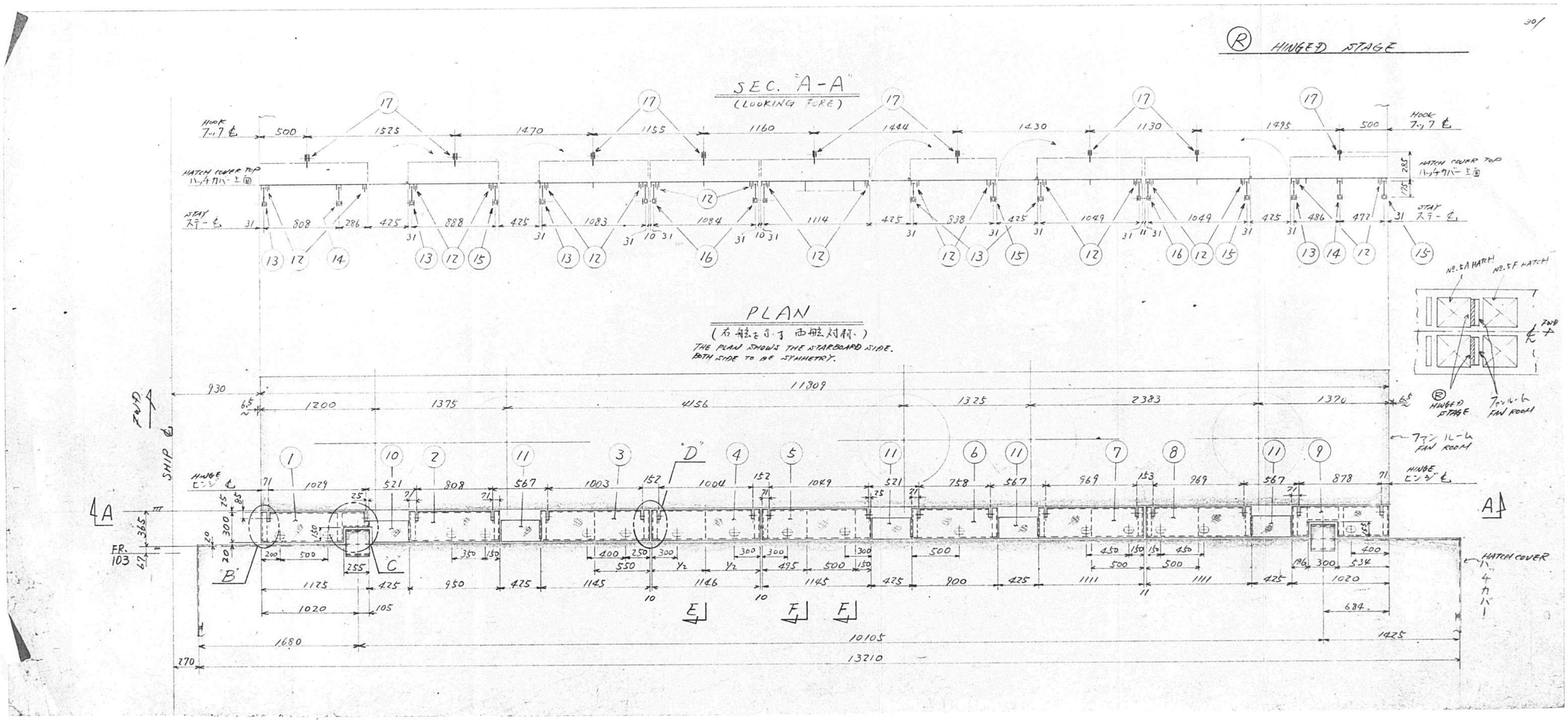
28/


STIFF. SEC.
上面 FLUSH
6 CH. PL.
COAM'G. TOP
75×6 F.B
EW : 4
ⒷⒸⒹⒺⒻⒼⒽⒾⓀ PLT'M. TYPICAL
NO WELD
TO BE SPREAD GREASE
E.W. : 4
NO WELD
TO BE SPREAD GREASE
E.W. : 4

29/

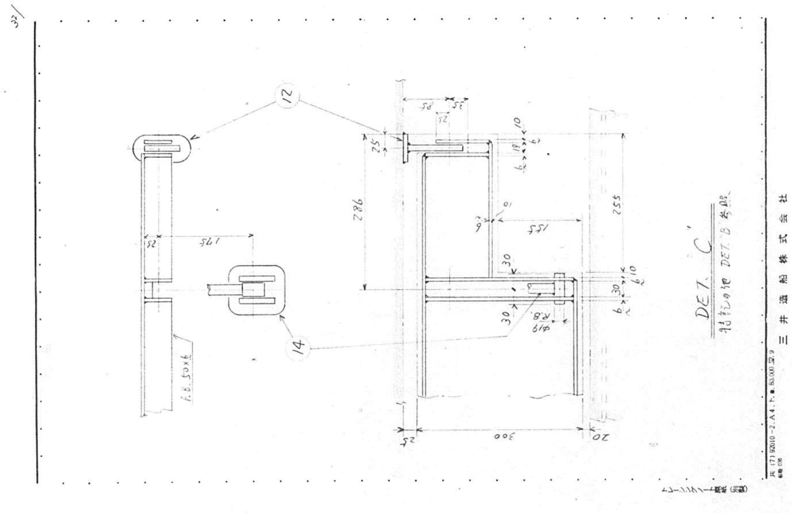

HOLDER
COAM'G. TOP
PLATFORM
SEC.
75×75×9 L
C30
135
140
EW : 5
HOLDER
COAM'G. TOP
PLATFORM
C30
75×75×9 L
140
EW : 5
JUMPING STOPPER
39×24 HOLE
COAM'G. TOP
PLT'M.
M20 BOLT & NUT
ℓ = S = 90
SPRING WASHER JIS B1251-20
WASHER JIS B1256-20
110
50
JUMPING STOPPER
COAM'G. TOP
PLT'M.
110
EXCEPT SPECIALLY MENTIONED FOLLOW
特記の他 Ⓨ1 に依う

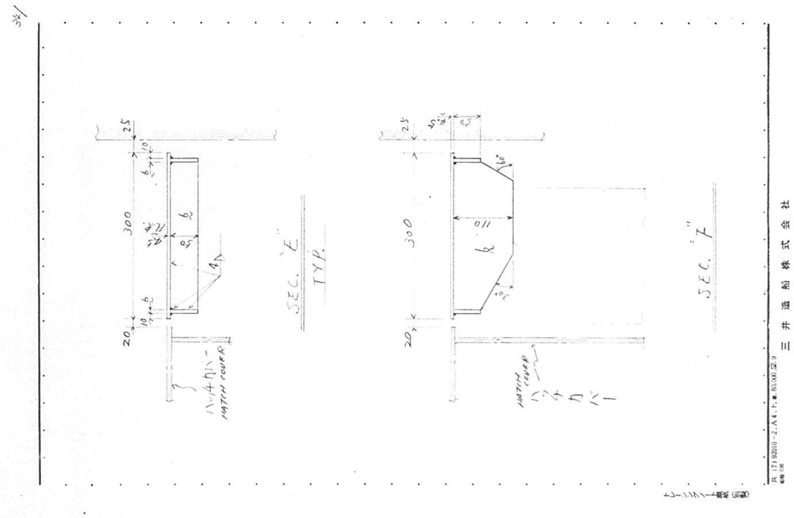
1055

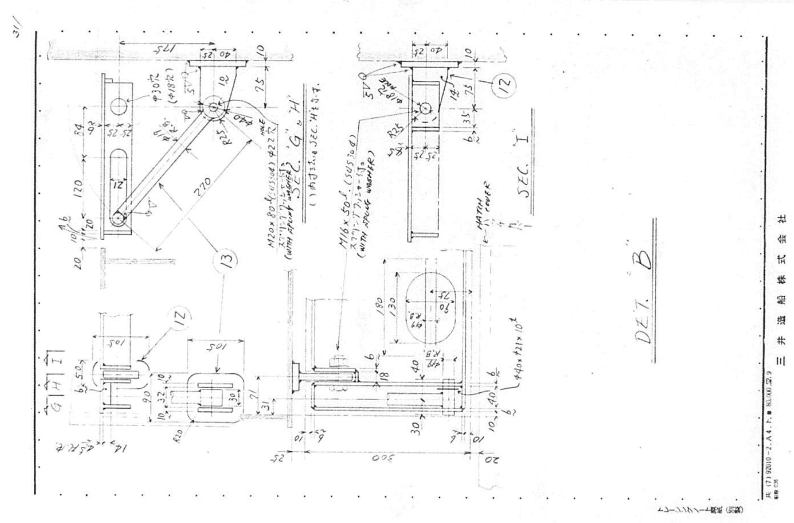


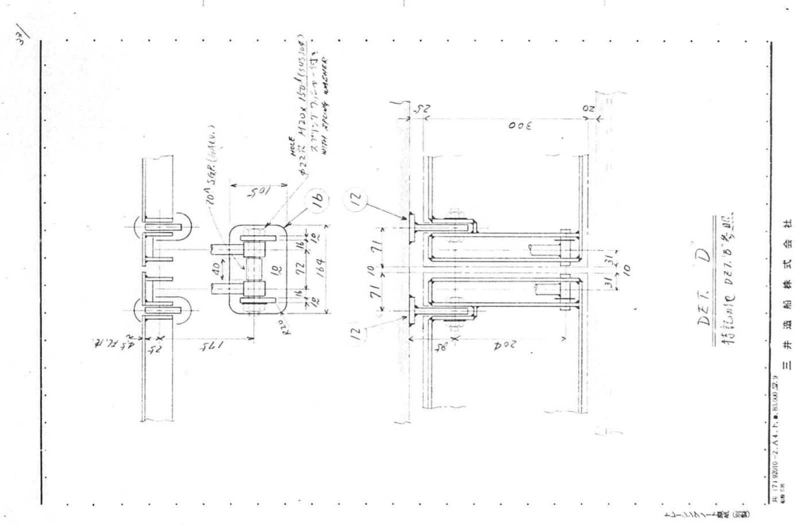
HINGED STAGE
SEC. "A-A"
(LOOKING FORE)
HOOK
HATCH COVER TOP
STAY
PLAN
THE PLAN SHOWS THE STARBOARD SIDE.
BOTH SIDE TO BE SYMMETRY.
FWD
SHIP ℄
HINGE
FAN ROOM
HATCH COVER
NO.5A HATCH
NO.5F HATCH
HINGED STAGE

1056


DET. 'C'
三井造船株式会社

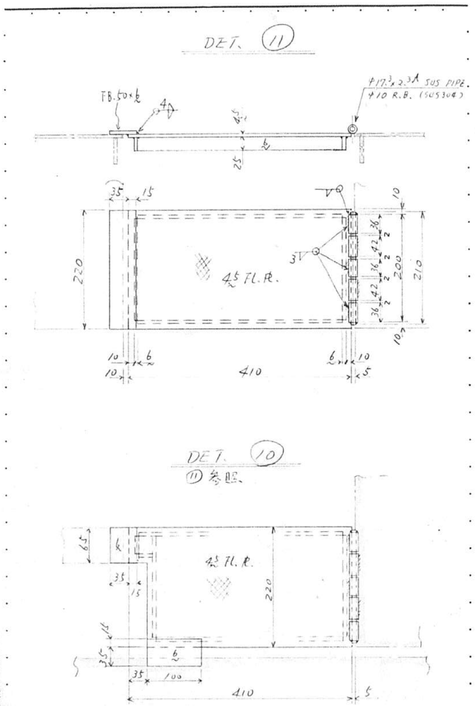

SEC. 'E' TYP.
SEC. 'F'
三井造船株式会社


DET. 'B'
SEC. 'I'
三井造船株式会社


DET. 'D'
三井造船株式会社

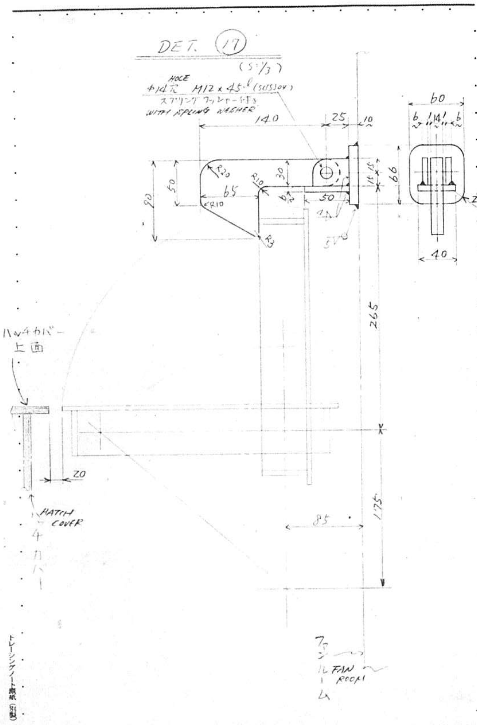
1057

35/



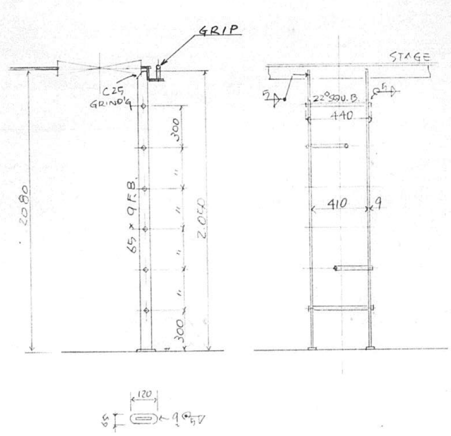
三 井 造 船 株 式 会 社

36/



三 井 造 船 株 式 会 社

37/



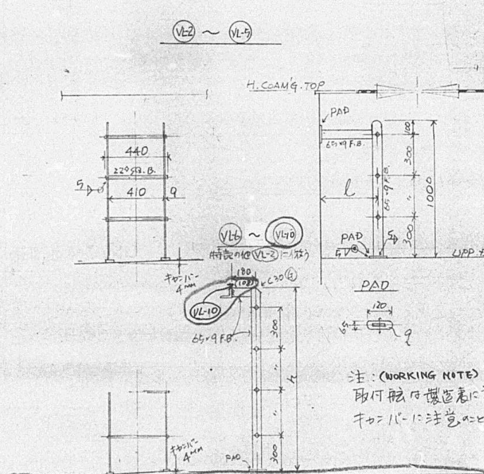
符号 NO.	名称 NAME	材料 MATERIAL	試験片 TEST PIECE	常備 USE	予備 SPARE	合計 TOTAL	関係工場 WORK SHOP	1個 ONE	合計 TOTAL	記事 REMARKS
				製造個数 QUANTITY				重量(kg) WEIGHT		

製造個数は　分を示す　（1隻分）　隻分製造のこと。

(VL-1) VERT. LADDER　尺度 SCALE

TSO.　DR. NO.　PAGE

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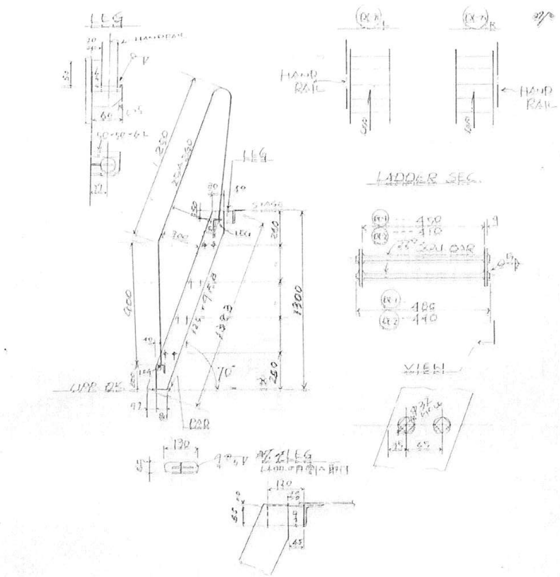
符号 NO.	名称 NAME	材料 MATERIAL	試験片 TEST PIECE	常備 USE	予備 SPARE	合計 TOTAL	関係工場 WORK SHOP	1個 ONE	合計 TOTAL	記事 REMARKS
VL-10										h = 1245
VL-9										h = 1194
VL-8										h = 1367
VL-7										h = 1361
VL-6										h = 1351
VL-5										ℓ = 330
VL-4										ℓ = 450
VL-3										ℓ = 435
VL-2	VERTICAL LADDER									ℓ = 350

製造個数は　分を示す　（1隻分）　隻分製造のこと。

VERT LADDER　尺度 SCALE

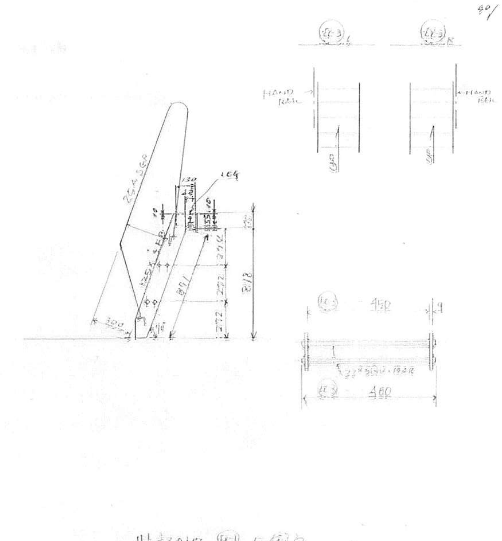
TSO.　DR. NO.　PAGE 6/6

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符号 NO.	名称 NAME	材料 MATERIAL	数量 QUANTITY	関係工場 WORK SHOP	重量 WEIGHT	記事 REMARKS
製造個数は	分を示す		(1隻分)			隻分製造のこと。

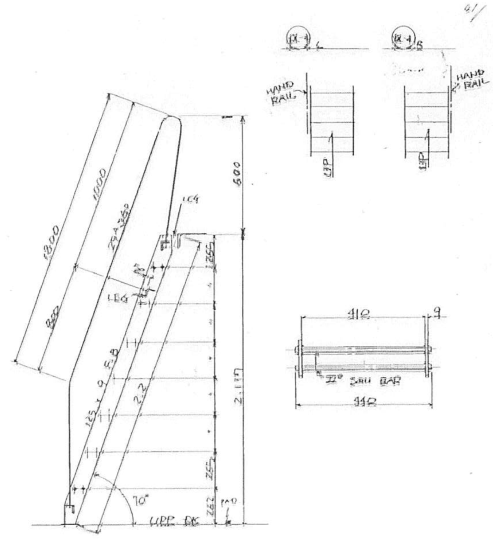
(DK-1) (DK-2) DK LADDER — 尺度 SCALE — TSO. — DR. NO. — PAGE



特記なき限り (DK-1) に倣う
EXCEPT SPECIALLY MENTIONED FOLLOW

符号 NO.	名称 NAME	材料 MATERIAL	数量 QUANTITY	関係工場 WORK SHOP	重量 WEIGHT	記事 REMARKS
製造個数は	分を示す		(1隻分)			隻分製造のこと。

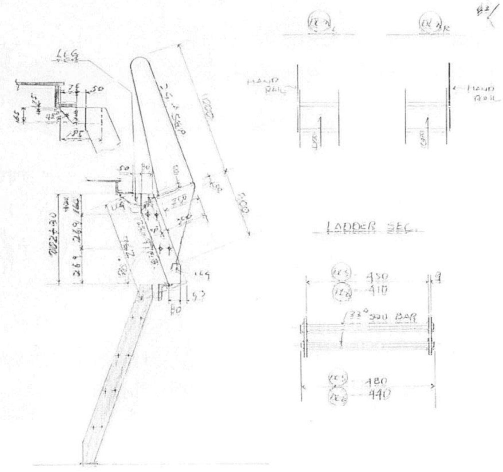
(DK-3) DK LADDER — 尺度 SCALE — TSO. — DR. NO. — PAGE



特記なき限り (DL-1) に倣う

符号 NO.	名称 NAME	材料 MATERIAL	数量 QUANTITY	関係工場 WORK SHOP	重量 WEIGHT	記事 REMARKS
製造個数は	分を示す		(1隻分)			隻分製造のこと。

(DK-4) DK LADDER — 尺度 SCALE — TSO. — DR. NO. — PAGE

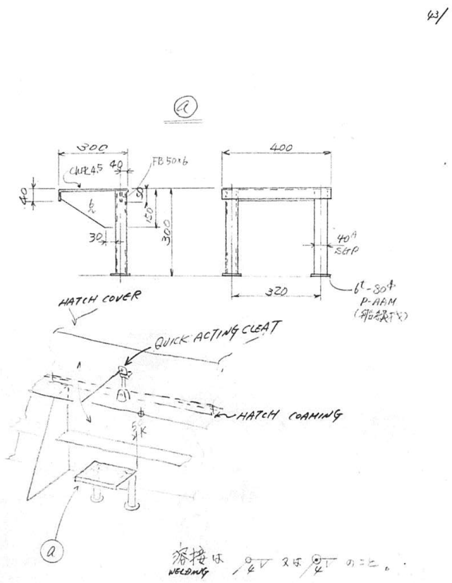


特記なき限り (DK-1) に倣う

符号 NO.	名称 NAME	材料 MATERIAL	数量 QUANTITY	関係工場 WORK SHOP	重量 WEIGHT	記事 REMARKS
製造個数は	分を示す		(1隻分)			隻分製造のこと。

(DK-5) (DK-6) DK LADDER — 尺度 SCALE — TSO. — DR. NO. — PAGE

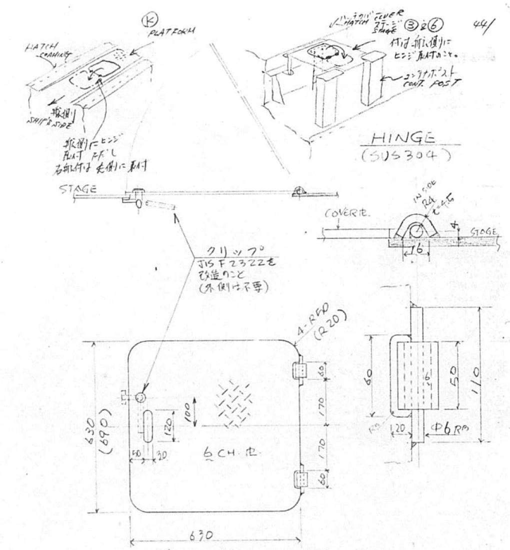
1059



符号 NO.	名称 NAME	材料 MATERIAL	試験片 TEST PIECE	常備 USE	予備 SPARE	合計 TOTAL	関係工場 WORK SHOP	1個 ONE	合計 TOTAL	記事 REMARKS
a	STEP	SGP&SS500 & P-AAM				1				

製造個数は 分を示す （1隻分） 隻分製造のこと。

ⓐ STEP — 尺度 SCALE — TSO. — DR. NO. — PAGE

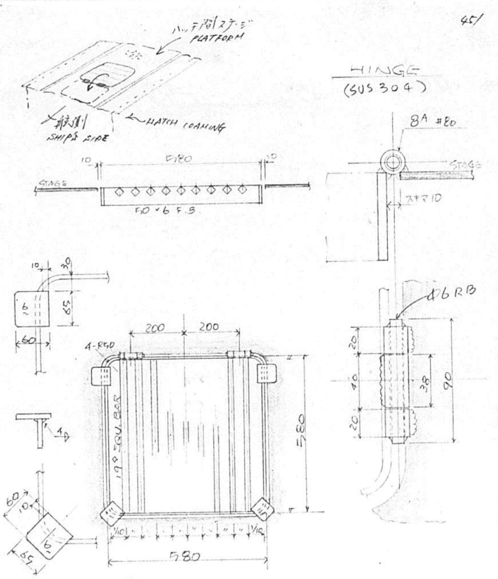


注
1) ( ) 寸法は (CP2) を示す
MARK SHOWS
2) 切断面はグラインダーで面取りのこと
CUTTING PART TO BE GROUND
3) ヒンジは総てSHIP C.L. 側へ取付
HINGE TO BE FITTED AT ℄ SIDE

符号 NO.	名称 NAME	材料 MATERIAL	試験片 TEST PIECE	常備 USE	予備 SPARE	合計 TOTAL	関係工場 WORK SHOP	1個 ONE	合計 TOTAL	記事 REMARKS

製造個数は 分を示す （1隻分） 隻分製造のこと。

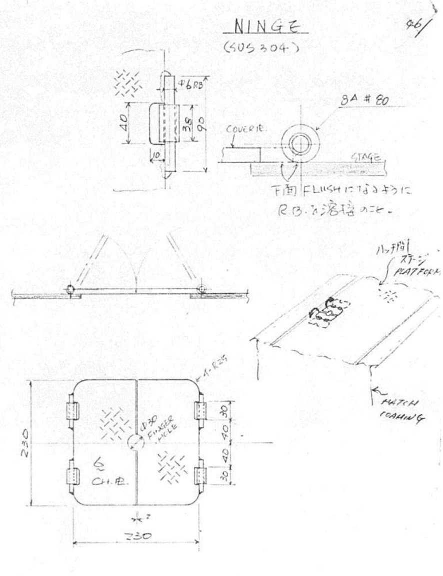
CP1 CP2 COVER — 尺度 SCALE 1/10 — TSO. — DR. NO. — PAGE



符号 NO.	名称 NAME	材料 MATERIAL	試験片 TEST PIECE	常備 USE	予備 SPARE	合計 TOTAL	関係工場 WORK SHOP	1個 ONE	合計 TOTAL	記事 REMARKS

製造個数は 分を示す （1隻分） 隻分製造のこと。

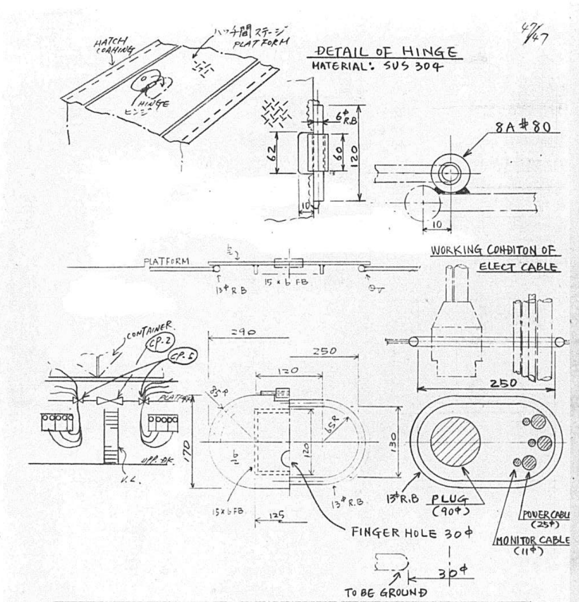
CP3 COVER — 尺度 SCALE — TSO. — DR. NO. — PAGE



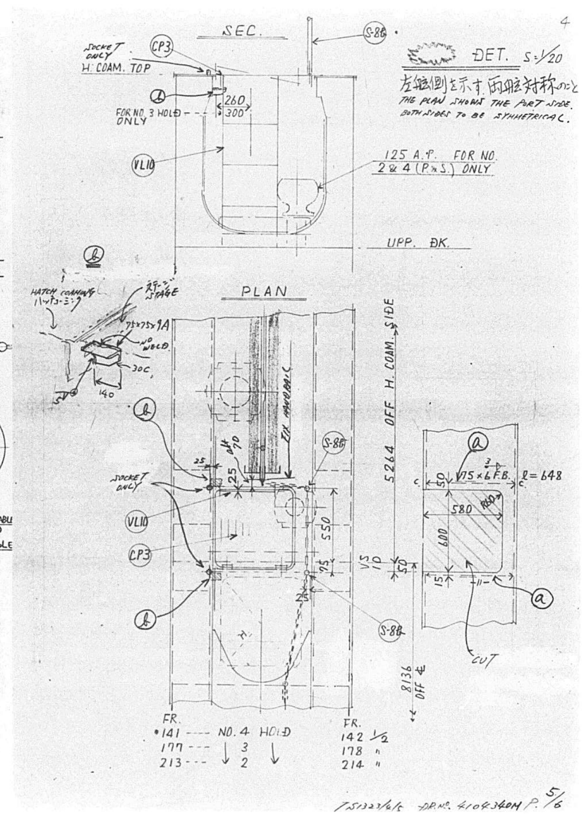
符号 NO.	名称 NAME	材料 MATERIAL	試験片 TEST PIECE	常備 USE	予備 SPARE	合計 TOTAL	関係工場 WORK SHOP	1個 ONE	合計 TOTAL	記事 REMARKS

製造個数は 分を示す （1隻分） 隻分製造のこと。

CP4 COVER — 尺度 SCALE 1/5 — TSO. — DR. NO. — PAGE



符号 NO.	COVER PLATE 名 称 N A M E	MILD STEEL 材 料 MATERIAL	試験片 TEST PIECE	SET 1 常用予備合計 USE SPARE TOTAL 製造個数 QUANTITY	関係工場 WORK SHOP	1個合計 ONE TOTAL 重量(kg) WEIGHT	記 事 REMARKS
	製造個数は	分を示す		(1 隻分)		隻分製造のこと。	
CP-5	COVER PLATE					尺度 SCALE	
						DR. NO.	PAGE



TS1323/6/6 DR. NO. 410434OH P. 5/6

ALT. NO.	OWNER DATE	OWNER LETTER NO.	USCG DATE	USCG LETTER NO.	ABS (FOR REFERENCE) DATE	ABS (FOR REFERENCE) LETTER NO.	USPH DATE	USPH LETTER NO.
ORIGINAL	APR. 3, 85 / APR. 15. 85	OFTS/MES 256 / OFTS/MES 278			15. AUG '86	TT/my T-8-2		
REV. A	APR. 29 1985	OFTS/MES 350						
REV. B	JUN, 19 1985	OFTS/MES 580						
REV. C	OCT. 10 1985	OFTS/MES 995						

FINISHEDPLAN

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SHIPYARD AND SHIP'S NO. & NAME			
MITSUI TAMANO		MITSUBISHI KOBE	
NO.1323	DOCTOR LYKES	NO.1158	JAMES LYKES
NO.1324	ALMERIA LYKES	NO.1159	JOSEPH LYKES
NO.1325	TILLIE LYKES	NO.1164	SOLON TURMAN

MITSUI ENGINEERING & SHIPBUILDING CO.,LTD.
TAMANO WORKS

SHIP DESIGN DEPARTMENT MANAGER — SHIP'S NO. **NO.1325** — SHIP'S NAME **TILLIE LYKES**

OUTFITTING DESIGN SECTION

コンテナ金物
CONTAINER FITTING

DATE (TEL 2235)
JOB NO. TS1323/24/25 — SCALE — LYKES REF. NO. 270004 — MITSUI DRAWING NO. 4104360
JCBCLASSIF. NO. D0403
(25 SHEETS WITH COVER)

1/24

PLAN RECORD

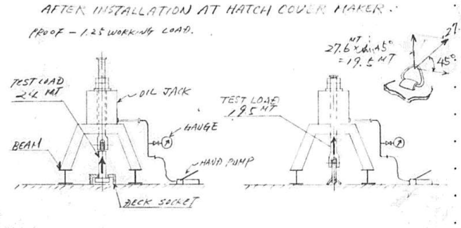
ALT. NO.	MARK	ALTERATION/DESCRIPTION	DATE & SIGNATURE
1		PREPARED FOR S.NO. 1323 AS FINISHED PLAN, MADE APPLICABLE TO S.NO.1324 AND S.NO. 1325.	NOVEMBER. 20. 86

DWG. NO. 4104360 — 2

NOTE

1. ABS CERTIFICATION TO BE REQUIRED FOR FITTING MARK 5, 6, 7 AND 8.
2. APPROVED LOW-HYDROGEN ELECTRODES TO BE USED FOR INITIAL SEVERAL BEADS OF FABRICATION AND PRODUCTION WELDS.
3. IN CASE OF WELDING OF CASTING AND HEAVY PLATING (CAST TO STEEL), WELDING JOINT TO BE SUITABLY PRE-HEATED PRIOR TO WELDING AND LOW-HYDROGEN ELECTRODE TO BE USED.
4. CASTING MATERIAL : SC42 (MAX. C = 0.2%)
5. TEST OF FITTINGS AFTER INSTALLATION (SPEC. PAGE D4-4)

TEN (10) PIECES EACH OF D-RING & DECK SOCKETS (AS SELECTED BY OWNER'S REP.) ON HATCH COVERS TO BE TESTED RANDOMLY (EACH ONE FITTING PER HATCH) AT THE MAX. CALCULATED LOAD SHOWN BELOW AFTER INSTALLATION AT HATCH COVER MAKER.
PROOF – 1.25 WORKING LOAD.

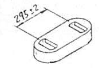
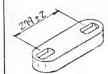
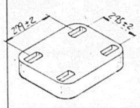


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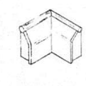
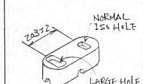
P– 1

MARK	NAME	ROUGH SKETCH	PROOF TEST LOAD	REMARK (SUPPLY PER SHIP: WORK / SPARE / TOTAL)
①	DECK SOCKET (RAISED TYPE) SINGLE K-1151-B	PAINTING	SEE P.6	WORK 8
②	DECK SOCKET (RAISED TYPE) DOUBLE K-1200	203±2; PAINTING (AS REGARDS PAINTING, PLEASE SEE PAGE 8)	"	WORK 252
③	DECK SOCKET (RAISED TYPE) DOUBLE LONGI. K-1201	279±2; PAINTING	"	WORK 10
④	DECK SOCKET (RAISED TYPE) QUADRUPLE K-1202	279±2, 203±2; PAINTING	"	WORK 7
⑤	DECK SOCKET (FLUSH TYPE) SINGLE K-1152-A	PAINTING	SEE P.6	WORK 56

4

MARK	NAME	ROUGH SKETCH	PROOF TEST LOAD	REMARK (P- /)
⑥	DECK SOCKET (FLUSH TYPE) DOUBLE K-1153-A	 PAINTING	SEE P.6	SUPPLY PER SHIP: WORK 12 / SPARE / TOTAL
⑦	DECK SOCKET (FLUSH TYPE) DOUBLE LONGI. K-1203	 PAINTING	〃	SUPPLY PER SHIP: WORK 74 / SPARE / TOTAL
⑧	DECK SOCKET (FLUSH TYPE) QUADRUPLE K-1204	 PAINTING	SEE P.6	SUPPLY PER SHIP: WORK 32 / SPARE / TOTAL
⑨	RUBBER PLUG K-1164	 —	—	4-PLUG WRENCH TO BE SUPPLIED SUPPLY PER SHIP: WORK 456 / SPARE / TOTAL
⑩	LIFTING SOCKET SINGLE K-1232	 PAINTING	SEE P.6	SUPPLY PER SHIP: WORK 96 / SPARE / TOTAL

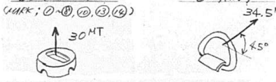
5

MARK	NAME	ROUGH SKETCH	PROOF TEST LOAD	REMARK (P- /)
⑪	D RING DOUBLE (D-RING) K-[illegible]	 PAINTING	SEE BELOW	SUPPLY PER SHIP: WORK 1340 / SPARE / TOTAL
⑫	CORNER CASTING K-[illegible]	 PAINTING	—	SUPPLY PER SHIP: WORK 48 / SPARE / TOTAL
⑬	DECK SOCKET WITH LARGE HOLE (RAISED TYPE) SINGLE	 LARGE HOLE PAINTING	SEE BELOW	SUPPLY PER SHIP: WORK 80 / SPARE 4 / TOTAL
⑭	DECK SOCKET WITH LARGE HOLE (RAISED TYPE) DOUBLE.	 NORMAL 151 HOLE LARGE HOLE PAINTING	SEE BELOW	SUPPLY PER SHIP: WORK 128 / SPARE 5 / TOTAL

PROOF TEST CAT MAKER'S SHOP)

DECK SOCKET (MARK; ①-⑧, ⑩, ⑬, ⑭)

D-RING



NOTE: PROOF TEST TO BE CARRIED OUT ONE PER 50 PCS FOR EACH FITTINGS

6

NOS OF CONT FITTING TABLE (½)

FITTING \ LOCATION	12 BAY (11 BAY, 13 BAY) ON HATCH COVER	12 BAY ON CONT. POST OR ON UPPDK	12 BAY IN HOLD (1 HOLD FOR)	16 BAY (17 BAY, 15 BAY) ON HATCH COVER	16 BAY ON CONT. POST	16 BAY IN HOLD (1 HOLD AFT)	22 BAY (21 BAY, 23 BAY) ON HATCH COVER	22 BAY ON CONT POST	22 BAY IN HOLD	26 BAY (25 BAY, 27 BAY) ON HATCH COVER	26 BAY ON CONT. POST	26 BAY IN HOLD	32 BAY (31 BAY, 33 BAY) ON HATCH COVER	32 BAY ON CONT POST	32 BAY IN HOLD
① DECK SOCKET (RAISED TYPE) SINGLE	–	8	–	0	0	–	–	0	–	0	0	–	–	0	–
② Do DOUBLE	12	–	–	32	–	–	16	–	–	32	–	–	16	–	–
③ Do DOUBLE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
④ Do Q'ADR	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
⑤ DECK SOCKET (FLUSH TYPE) SINGLE	–	–	–	–	–	40	–	–	–	–	–	–	–	–	–
⑥ Do. DOUBLE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
⑦ Do. DOUBLE	–	–	16	–	–	–	–	–	20	–	–	–	–	–	12
⑧ Do. Q'ADR	–	–	–	–	–	–	–	–	–	–	–	–	–	–	4
⑨ RUBBER PLUG	8	–	32	8	–	40	8	–	40	8	–	–	8	–	40
⑩ LIFTING SOCKET	8	–	–	8	–	–	8	–	–	8	–	–	8	–	–
⑪ D-RING	P 32 / S 30	24	–	P 78 / S 74	24	–	P 38 / S 36	8	–	P 78 / S 74	24	–	P 38 / S 36	8	–
⑫ CORNER CASTING	–	4	–	–	4	–	–	4	–	–	4	–	–	4	–
⑬ DECK SOCKET (LARGE HOLE) (RAISED TYPE) SINGLE	–	4	–	4	12	–	–	4	–	4	12	–	–	4	–
⑭ Do. DOUBLE	8	–	–	16	–	–	8	–	–	16	–	–	8	–	–

FITTING \ LOCATION	34 BAY ON HATCH COVER	34 BAY ON CONT POST	34 BAY IN HOLD	42 BAY (41 BAY, 43 BAY) ON HATCH COVER	42 BAY ON CONT POST	42 BAY IN HOLD	46 BAY (47 BAY, 45 BAY) ON HATCH COVER	46 BAY ON CONT POST	46 BAY IN HOLD	52 BAY ON HATCH COVER	52 BAY ON CONT POST	52 BAY IN HOLD	54 BAY ON HATCH COVER	54 BAY ON CONT POST	54 BAY IN HOLD
① DECK SOCKET (RAISED TYPE) SINGLE	–	0	–	–	0	–	–	0	–	–	0	–	–	0	–
② Do. DOUBLE	32	–	–	16	–	–	32	–	–	16	–	–	16	–	–
③ Do. DOUBLE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
④ Do. Q'ADR	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
⑤ DECK SOCKET (FLUSH TYPE) SINGLE	–	–	16	–	–	–	–	–	–	–	–	–	–	–	–
⑥ Do. DOUBLE	–	–	12	–	–	–	–	–	–	–	–	–	–	–	–
⑦ Do. DOUBLE	–	–	–	–	–	4	–	–	–	–	–	–	–	–	–
⑧ Do. Q'ADR	–	–	–	–	–	8	–	–	–	–	–	–	–	–	–
⑨ RUBBER PLUG	8	–	40	8	–	40	8	–	–	8	–	–	8	–	–
⑩ LIFTING SOCKET	8	–	–	8	–	–	8	–	–	8	–	–	8	–	–
⑪ D-RING	P 76 / S 72	16	–	P 38 / S 36	8	–	P 76 / S 72	16	–	P 38 / S 36	8	–	P 38 / S 36	8	–
⑫ CORNER CASTING	–	4	–	–	4	–	–	4	–	–	4	–	–	4	–
⑬ DECK SOCKET (LARGE HOLE) (RAISED TYPE) SINGLE	–	8	–	–	4	–	–	8	–	–	4	–	–	4	–
⑭ Do. DOUBLE	16	–	–	8	–	–	16	–	–	8	–	–	8	–	–

NOTE : 55 BAY HAS NO FITTINGS

7

NOS OF CONT. FITTING TABLE (2/2)

FITTING \ LOCATION	58 BAY (57 BAY / 59 BAY) ON HATCH COVER	58 BAY ON UPT. DECK	58 BAY IN HOLD	62 BAY (61 BAY / 63 BAY) ON HATCH COVER	62 BAY ON CONT POST	62 BAY IN HOLD	66 BAY (65 BAY / 67 BAY) ON HATCH COVER	66 BAY ON CONT POST	66 BAY IN HOLD	72 BAY (71 BAY / 73 BAY) ON HATCH COVER	72 BAY ON STOOL	72 BAY IN HOLD	TOTAL (PCS)
(1) DECK SOCKET (RAISED TYPE) SINGLE	-	-	-	-	0	-	-	0	-	-	-	-	8
(2) Do DOUBLE	-	-	-	16	-	-	16	-	-	-	-	-	252
(3) Do DOUBLE	-	10	-	-	-	-	-	-	-	-	0	-	10
(4) Do Q'ADR	-	7	-	-	-	-	-	-	-	-	0	-	7
(5) DECK SOCKET (FLUSH TYPE) SINGLE	-	-	-	-	-	-	-	-	-	-	-	-	56
(6) Do. DOUBLE	-	-	-	-	-	-	-	-	-	-	-	-	12
(7) Do. DOUBLE	-	-	-	-	-	8	-	-	8	-	6	-	74
(8) Do. Q'ADR	-	-	-	-	-	6	-	-	6	-	9	-	33
(9) RUBBER PLUG	-	-	-	8	-	40	8	-	40	-	48	-	456
(10) LIFTING SOCKET	-	-	-	8	-	-	8	-	-	-	-	-	96
(11) D-RING	-	-	-	P 38 / S 36	8	-	P 38 / S 36	8	-	-	-	-	1340
(12) CORNER CASTING	-	-	-	-	4	-	-	4	-	-	-	-	48
(13) DECK SOCKET (LARGE HOLE) (RAISED TYPE) SINGLE	-	-	-	-	4	-	-	4	-	-	-	-	80
(14) Do. DOUBLE	-	-	-	8	-	-	8	-	-	-	-	-	[illegible]

4 } THOSE ARE SUPPLIED
5 } AS SPARE

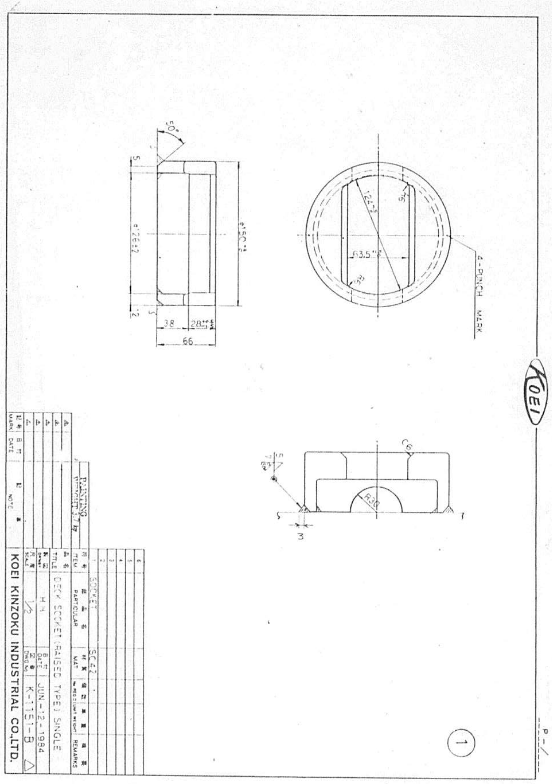
NOTE: PAINTING

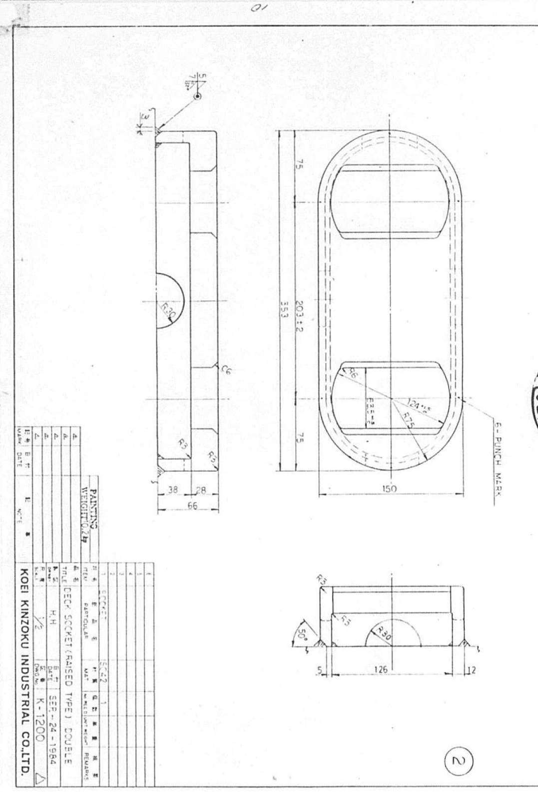
	SURFACE PREPARATION	1 ST COAT	2nd COAT	3rd COAT
OUT SIDE	BLAST (Sa 2.5)	INORGANIC ZINC (75μ)	SAME AS SURROUNDING PART PAINTING.	
INSIDE	BLAST (Sa 2.5)	INORGANIC ZINC (75μ)	TAR EPOXY (200μ) ※	-
	DONE BY CONT. FITTING MAKER		DONE BY YARD OR HATCH COVER MAKER	

FITTINGS AND SOCKETS TO BE WELDED PRIOR TO SANDBLASTING AND COATING OF HATCH COVER

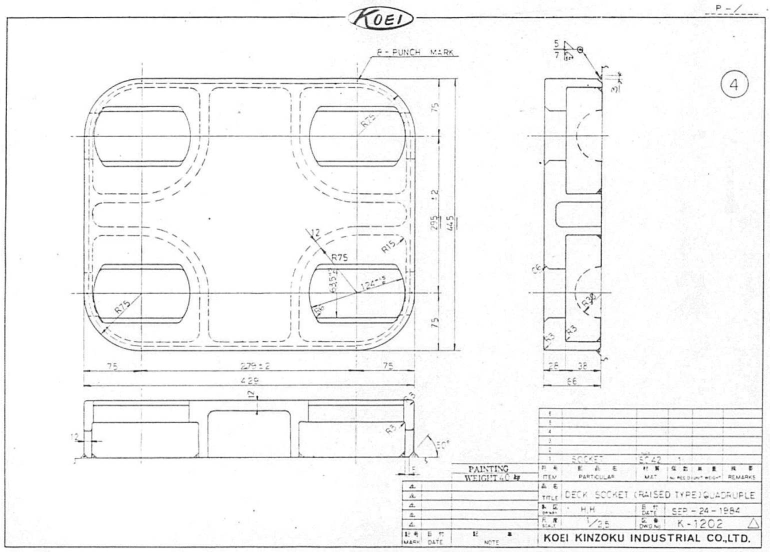
※ WELDING EFFECT PARTS ONLY. DAMAGED PARTS BY WELDING TO BE CLEANED BY WIRE BRUSH OR SIMILAR WAY PRIOR TO COATING OF TAR EPOXY PAINT.

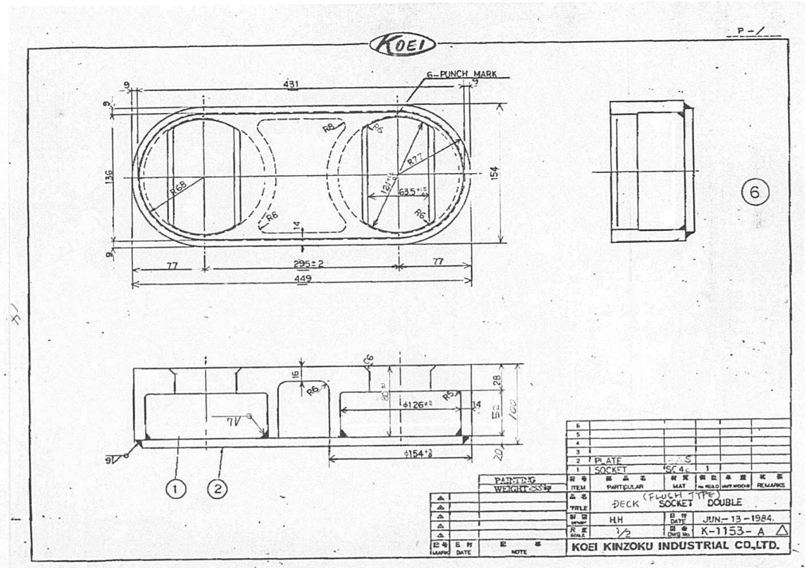
THIS ONLY APPLIES TO HOLD AND DECK, NOT ON HATCH COVERS.

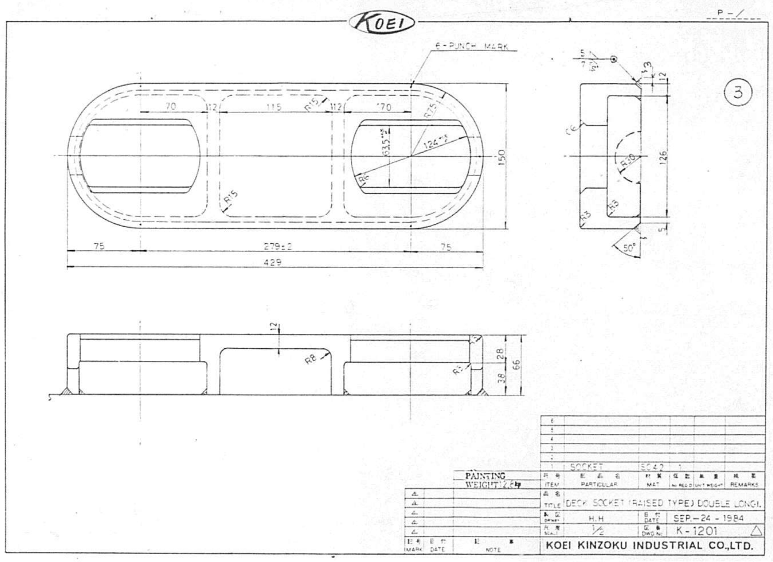


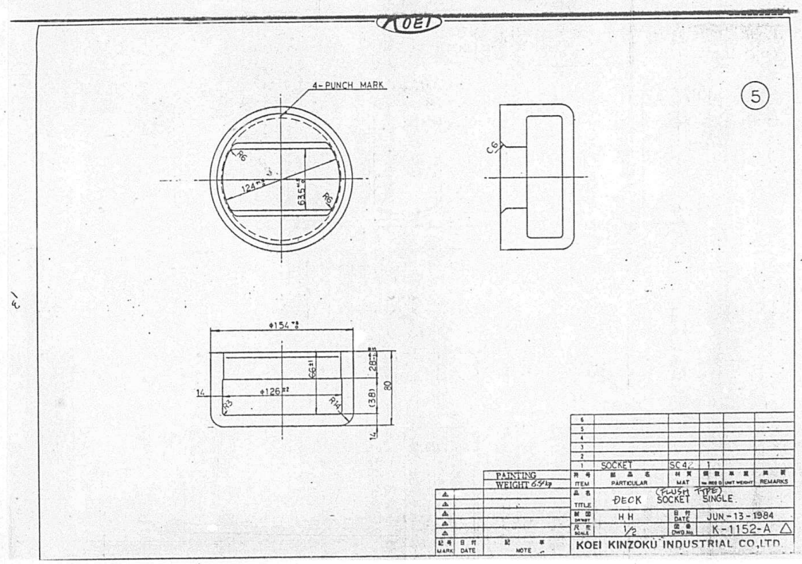


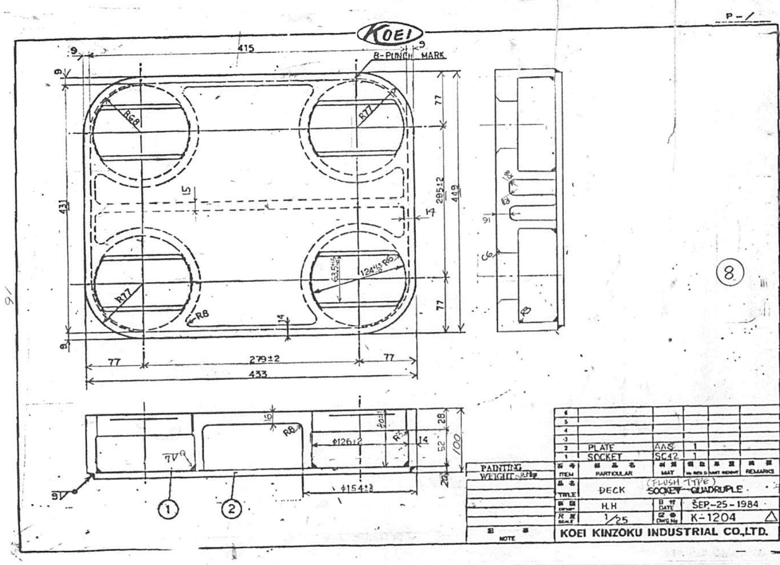
1064

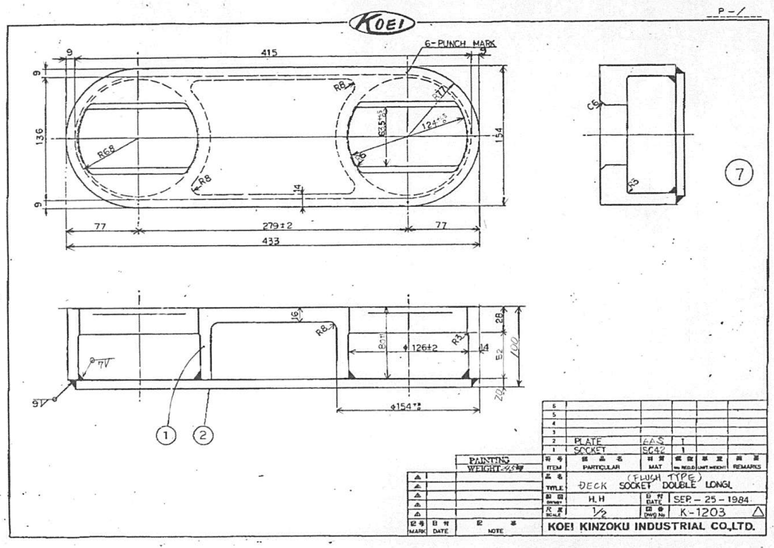

KOEI
P-/
6-PUNCH MARK
4
PAINTING
SOCKET
SC42
DECK SOCKET (RAISED TYPE) QUADRUPLE
H.H
SEP-24-1984
1/2.5
K-1202
KOEI KINZOKU INDUSTRIAL CO.,LTD.

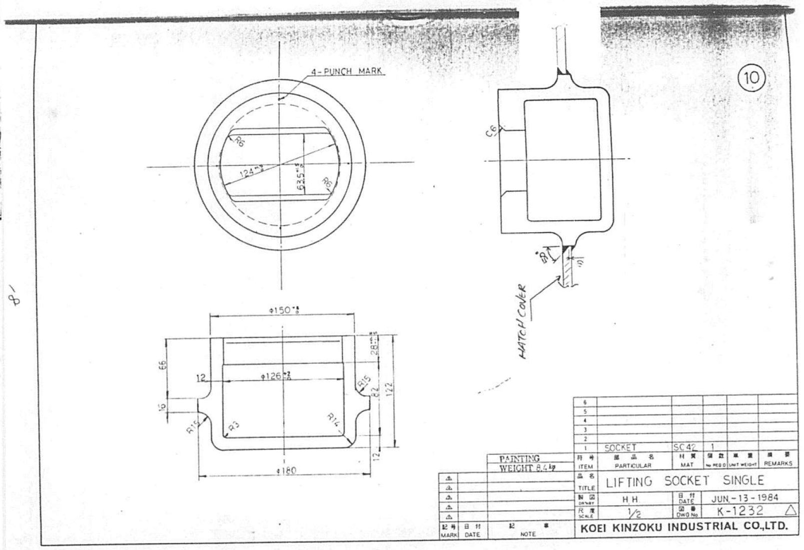

KOEI
P-/
6-PUNCH MARK
6
PLATE
SOCKET
SC46
DECK (FLUSH TYPE) SOCKET DOUBLE
H.H
JUN-13-1984
1/2
K-1153-A
KOEI KINZOKU INDUSTRIAL CO.,LTD.

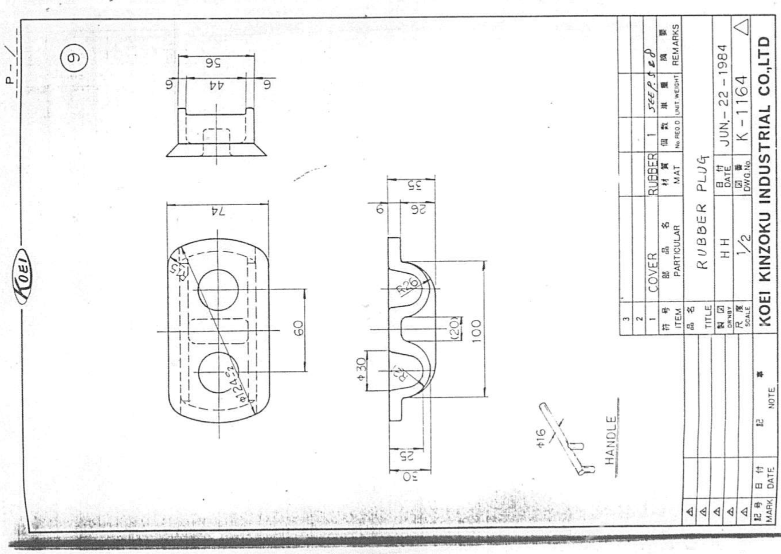

KOEI
P-/
6-PUNCH MARK
3
PAINTING
SOCKET
SC42
DECK SOCKET (RAISED TYPE) DOUBLE LONG
H.H
SEP-24-1984
1/2
K-1201
KOEI KINZOKU INDUSTRIAL CO.,LTD.


KOEI
4-PUNCH MARK
5
PAINTING
SOCKET
SC46
DECK (FLUSH TYPE) SOCKET SINGLE
H.H
JUN-13-1984
1/2
K-1152-A
KOEI KINZOKU INDUSTRIAL CO.,LTD.

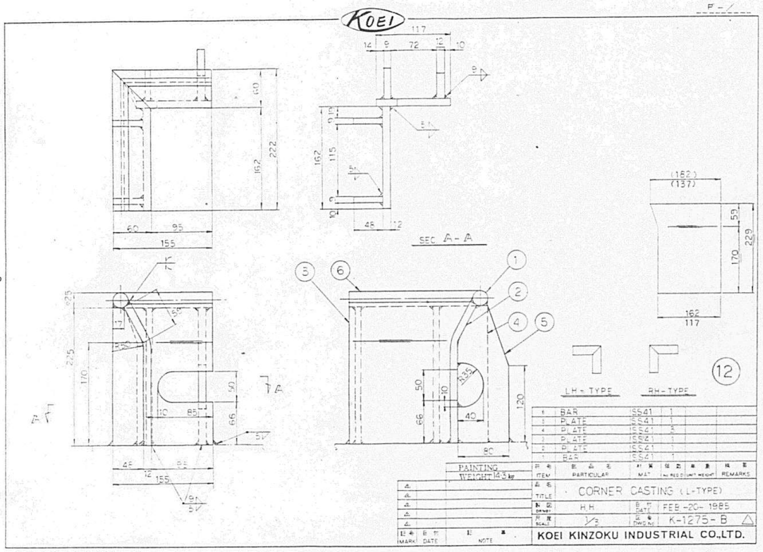

KOEI
8-PUNCH MARK
PLATE SS41
SOCKET SC42
PAINTING WEIGHT
DECK SOCKET QUADRUPLE (FLUSH TYPE)
H.H
SEP.-25-1984
1/25
K-1204
KOEI KINZOKU INDUSTRIAL CO.,LTD.

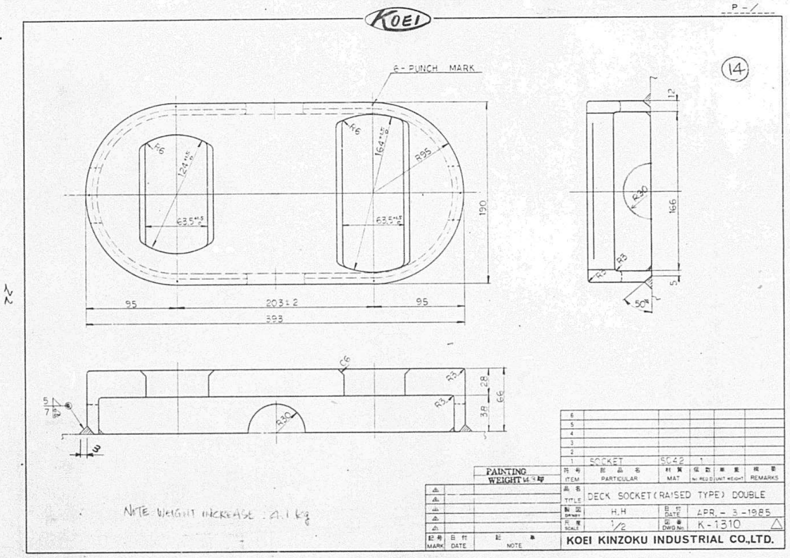

KOEI
6-PUNCH MARK
PLATE SS41
SOCKET SC42
PAINTING WEIGHT
DECK SOCKET DOUBLE LONGL (FLUSH TYPE)
H.H
SEP.-25-1984
1/2
K-1203
KOEI KINZOKU INDUSTRIAL CO.,LTD.

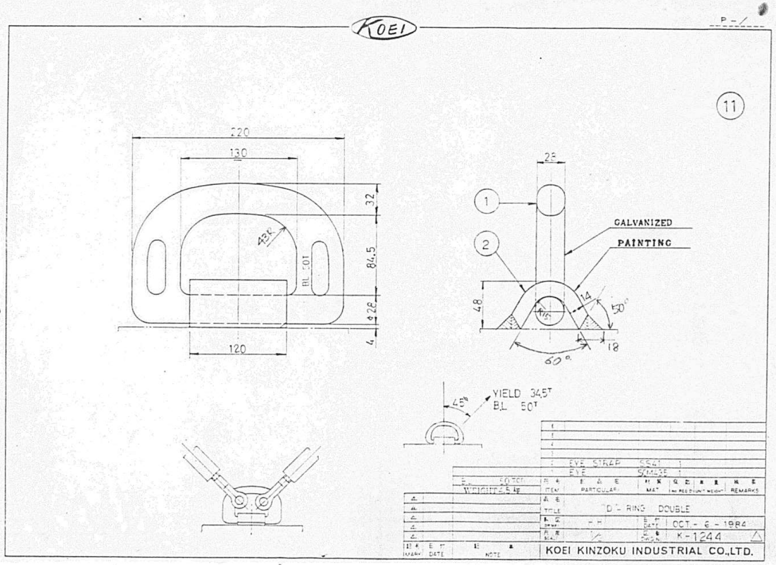

4-PUNCH MARK
HATCH COVER
SOCKET SC42
PAINTING WEIGHT 8.4kg
LIFTING SOCKET SINGLE
H H
JUN-13-1984
1/2
K-1232
KOEI KINZOKU INDUSTRIAL CO.,LTD.

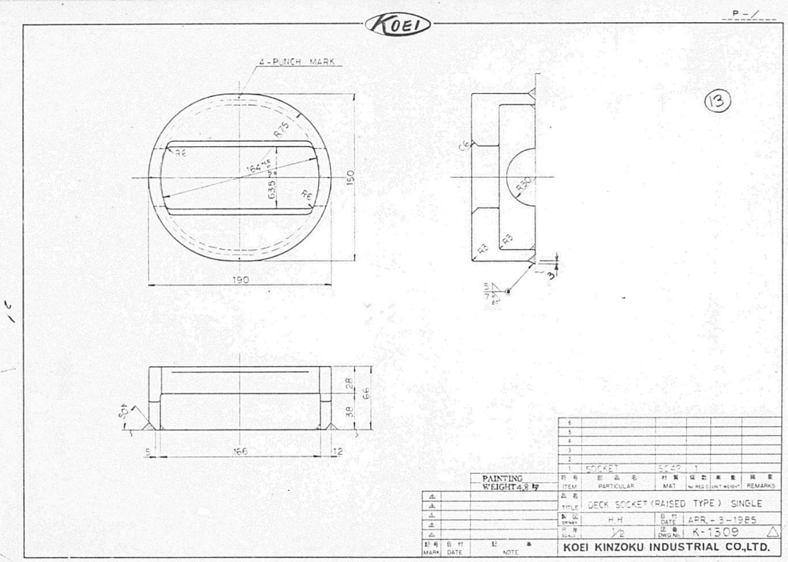

KOEI
HANDLE
COVER RUBBER 1
RUBBER PLUG
H H
JUN.-22-1984
1/2
K-1164
KOEI KINZOKU INDUSTRIAL CO.,LTD

1066


KOEI
SEC A-A
LH-TYPE
RH-TYPE
12
PAINTING
CORNER CASTING (L-TYPE)
H.H
FEB-20-1985
1/3
K-1275-B
KOEI KINZOKU INDUSTRIAL CO.,LTD.


KOEI
6-PUNCH MARK
14
SOCKET
SC42
PAINTING
DECK SOCKET (RAISED TYPE) DOUBLE
H.H
APR.-3-1985
1/2
K-1310
KOEI KINZOKU INDUSTRIAL CO.,LTD.

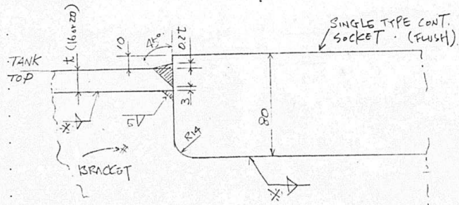

KOEI
11
GALVANIZED
PAINTING
YIELD 34.5T
BL 50T
EYE STRAP
EYE
"D" RING DOUBLE
H.H
OCT-2-1984
1/2
K-1244
KOEI KINZOKU INDUSTRIAL CO.,LTD.


KOEI
4-PUNCH MARK
13
SOCKET
PAINTING
DECK SOCKET (RAISED TYPE) SINGLE
H.H
APR.-3-1985
1/2
K-1309
KOEI KINZOKU INDUSTRIAL CO.,LTD.

1067

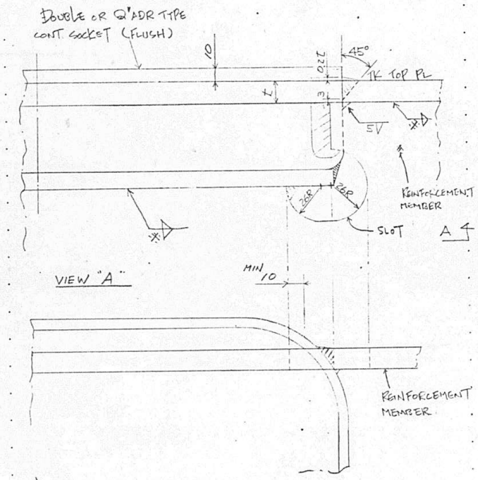
INSTALLATION DETAIL OF FLUSH
TYPE CONT. SOCKET

(MARK OF FITT.)
⑤ SINGLE TYPE CONT. SOCKET (TYPICAL).



NOTE :
- REGARDING ARR'T OF REINFORCEMENT FOR CONE BASE, PLS REFER DWG OF "DOUBLE BOTTOM IN HOLD (FORE), (AFT)" (DWG No. 2101101, 2101102).
- WELDING LEG LENGTH MARKED ✻ TO BE MET REQUIREMENT OF ABS, PLEASE SEE ABOVE SAID DRAWING AND WELDING TABLE (DWG. No. 2100832).

⑥~⑧ DOUBLE OR Q'ADR TYPE CONT. SOCKET (TYPICAL)
(MARK OF FITT.)



NOTE
1. APPROVED LOW-HYDROGEN ELECTRODES TO BE USED FOR INITIAL SEVERAL BEADS OF FABRICATION AND PRODUCTION WELD.
2. IN CASE OF WELDING OF CASTING AND HEAVY PLATING (CAST TO STEEL), WELDING JOINT TO BE SUITABLY PRE-HEATED PRIOR TO WELDING AND LOW-HYDROGEN ELECTRODE TO BE USED.

ALT. NO.	OWNER DATE	OWNER LETTER NO.	USCG DATE	USCG LETTER NO.	ABS (FOR REFERENCE) DATE	ABS LETTER NO.	USPH DATE	USPH LETTER NO.
ORIGINAL	[illegible]	[illegible]			13 Aug '86	77/my 7-8-3		
A	[illegible]	[illegible]						

APPROVAL OF OWNER & REGULATORY BODIES

FINISHEDPLAN

This drawing/document was produced by Mitsui Engineering & Shipbuilding Co., Ltd. (MES) You are kindly requested to handle it in strict confidence and it is prohibited to copy or reproduce it to any third party without written permission of both MES & Lykes Bros. Steamship Co., Inc.

SHIPYARD AND SHIP'S NO. & NAME			
MITSUI TAMANO		MITSUBISHI KOBE	
NO.1323	DOCTOR LYKES	NO.1158	JAMES LYKES
NO.1324	ALMERIA LYKES	NO.1159	JOSEPH LYKES
NO.1325	TILLIE LYKES	NO.1164	SOLON TURMAN

MITSUI ENGINEERING & SHIPBUILDING CO., LTD.
TAMANO WORKS

SHIP DESIGN DEPARTMENT MANAGER — SHIP'S NO. **NO.1325** — SHIP'S NAME **TILLIE LYKES**

OUTFITTING DESIGN SECTION

MITSUI ENGINEERING & SHIPBUILDING CO., LTD. SHIP DESIGN DEPARTMENT — NOV 10 1986

STRENGTH CALCULATION OF CONTAINER LOADING
(3 TIER STACK ON DK)

DATE (TEL 2285)

JOB NO. TS1323/24/25 — SCALE — LYKES REF. NO. 270005 — MITSUI DRAWING NO. 4104330

(34 SHEETS WITH COVER)

1/34

PLAN RECORD

ALT. NO.	MARK	ALTERATION/DESCRIPTION	DATE & SIGNATURE
1		PREPARED FOR S.NO.1323 AS FINISHED PLAN, MADE APPLICABLE TO S.NO.1324 AND S.NO.1325	NOVEMBER 20.86 [illegible]

DWG. NO. 4104330

2/

1. GENERAL

THIS SHEET SHOWS THE CALCULATION OF THE ALLOWABLE CONT. WEIGHT AND THE LASHING FORCE

1.1 LOADING PATTERN OF CONTAINER

CONTAINER ON DECK
① CONTAINER ON DECK WHICH SHALL BE SECURED BY LASHING SYSTEM. (SEE PAGE 5 ~ 10, 27 ~ 31)
② 20' CONTAINER ON DECK WHICH SHALL BE SUPPORTED BY 40' CELL GUIDE [illegible] (SEE PAGE 11 ~ 13)

CONTAINER IN HOLD
③ 20' CONTAINER IN HOLD FOR MIXED LOADING BAY OF 20'/40' CONTAINERS. (SEE PAGE 14 ~ 18, 32 ~ 34)
④ MIXED LOADING OF 40' AND 45' CONTAINER IN HOLD (SEE PAGE 19 ~ 26)

1.2 CALCULATION FORMULA

ALL CALCULATION IN THIS SHEET ARE BASED ON "NV FORMULA".

2. DESIGN CONDITION

2.1 SHIP MOTION

[illegible] MAX SHIP MOTION [illegible] TO BE [illegible], WHICH ARE ALSO SPECIFIED IN "NV" RULE.

① MAX GM = 3.25 [illegible]
② MAX ROLLING ANGLE = 26.12 deg
③ MIN [illegible]

三 井 造 船 株 式 会 社

4104330 3/

2.2 CONTAINER WEIGHT

MAX CONTAINER WEIGHT ARE AS FOLLOWS :-

- 20' CONT → 20LT
- 40' CONT → 30LT
- 45' CONT → 32LT

2.3 CRITICAL VALUE

AS PER "ISO" STANDARD, CONTAINER STRENGTH LIMIT ARE GIVEN AS FOLLOWS.

- MAX ALLOWABLE LATERAL RACKING FORCE ⇒ 15LT
- MAX LATERAL LOAD ON CONTAINER CORNER FITTING [illegible] LASHING ⇒ 15LT

THE ALLOWABLE CONTAINER WEIGHT [illegible] LIMITED BY ABOVE CRITICAL VALUES.

3 WORD DEFINITION

- INNER CONTAINER : CONTAINER ON DECK WHICH HAS NO WIND LOAD.
- OUTERMOST CONTAINER : CONTAINER ON DECK WHICH HAS WIND LOAD.

4/

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4 [illegible]

4.1 CONT[illegible] ON DECK WHICH [illegible] BY LASHING SYSTEM

① CALC[illegible] CASE
FOLLOWING CONTAIN[illegible] CASES WERE [illegible].

CASE 1 [illegible] + 4[illegible] × [illegible]

CASE 2 40' [illegible]

CASE 3 45' CONT × 3 TIERS

CASE 4 20' CONT × 2 TIERS

② RESULT[illegible]

②-1. CASE 1 ~ 3

i) [illegible] CONTAINER (WITH WIND FORCE)

[illegible] FORCE AND HORIZONTAL COMPONENT OF LASHING TENSION ON VARIOUS GM ARE SHOWN IN FIG 1-1 ~ FIG 1-3 RESPECTIVELY. [illegible] ALLOWABLE CONTAINER WEIGHT AND GM [illegible] FIG 1-4 [illegible]

ii) INNER CONTAINER (NO WIND FORCE)

CONTAINER [illegible] GM (2.25M) AS SHOWN ON PAGE 6. (WITHOUT WEIGHT REDUCTION) UNDER THE [illegible]

< CASE 1 & 2 >

- RACKING FORCE 13.55 LT < 15 LT
- HOR. COMP OF LASHING TENS. 10.27 LT < 15 LT

< CASE 3 >

- RACKING FORCE 15.92 LT ~ 15 LT
- HOR. COMP OF LASHING TENS. 10.77 LT < 15 LT

②-2. CASE 4

20' CONTAINER HAS ENOUGH STRENGTH UNDER GM (2.25M) AS SHOWN BELOW (WITHOUT WEIGHT REDUCTION)

1) OUTERMOST CONTAINER (WITH WIND FORCE)

- RACKING FORCE 9.[illegible] LT < 15 LT
- HORI. COMP. OF LASHING TENS 7.22

2) INNER CONTAINER (NO WIND FORCE)

INNER CONTAINER HAS LESS [illegible] OUTERMOST CONTAINER. SO INNER CONTAINER HAS ENOUGH STRENGTH UNDER GM (2.25M). (WITHOUT WEIGHT REDUCTION)

[ON DECK, LASHING SYSTEM]

FIG 1-1 (45' & 40' MIXED LOADING) (OUTERMOST CONT WHICH HAS WIND LOAD)

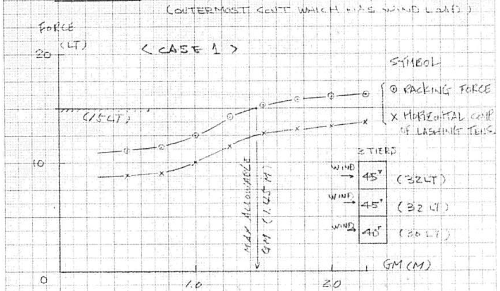
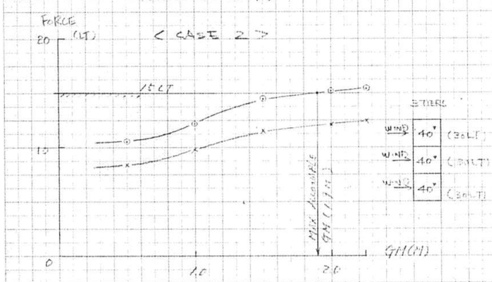
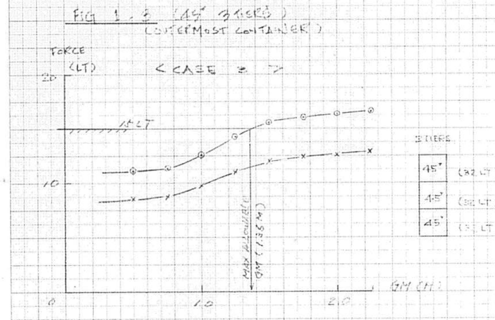


FIG 1-2 (40' 3 TIERS) (OUTERMOST CONT)



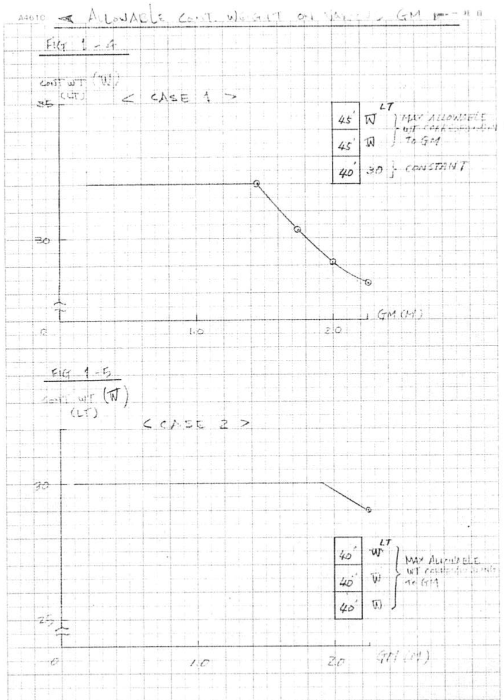
[ON DECK, LASHING SYSTEM]

FIG 1-3 (45' 3 TIERS) (OUTERMOST CONTAINER)

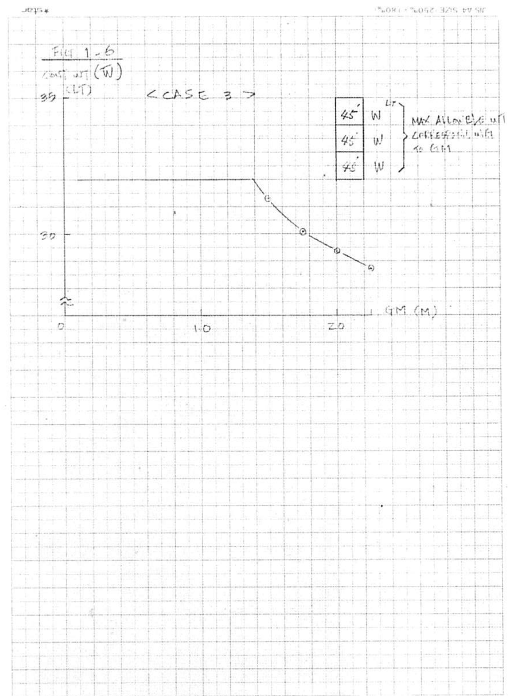


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[ON DECK, LASHING SYSTEM]



[ON DECK, LASHING SYSTEM]



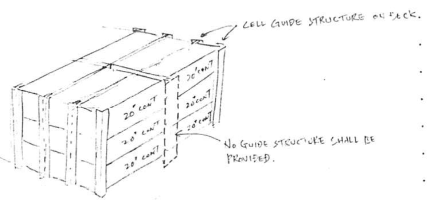
[ON DECK, CELL GUIDE]

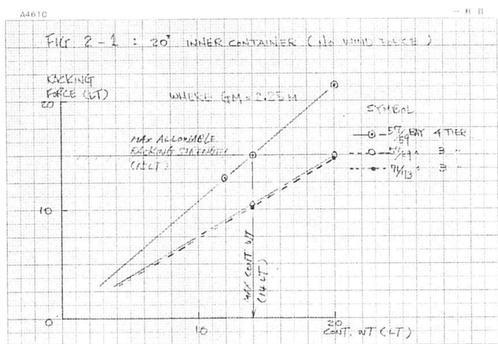
4.2 20' CONTAINER ON DECK WHICH IS LOADED BY 40' CELL GUIDE SLOT. (BAY NO. 51, 59 71 & 73)

< RESULT >

RACKING FORCES ON VARIOUS CONTAINER WT ARE SHOWN IN FIG 2-1, & 2.2, UNDER GM = 2.25M. RELATION BTWN ALLOWABLE CONTAINER WEIGHT AND VARIOUS GM ARE SHOWN IN FIG 2-3 & FIG 2-4.
CONTAINER WEIGHT NEED TO BE REDUCED DEPENDED ON FIG 2-3 & FIG 2-4.

NOTE:
THE GUIDELESS END OF 20' CONTAINER SHOULD BE TREATED AS A FREE END. IN ANOTHER WORD, EACH FREE END OF CONTAINER MUST BEAR THE HALF OF THE TOTAL RACKING PER EACH CONTAINER BY ITSELF. ACCORDINGLY THE CALCULATION FOR THE SUBJECT STACK OF 20' CONTAINERS CAN BE DONE IN THE SAME WAY FOR A FREE STACK (i.e. A STACK WITHOUT LASHING NOR SUPPORTING STRUCTURE)





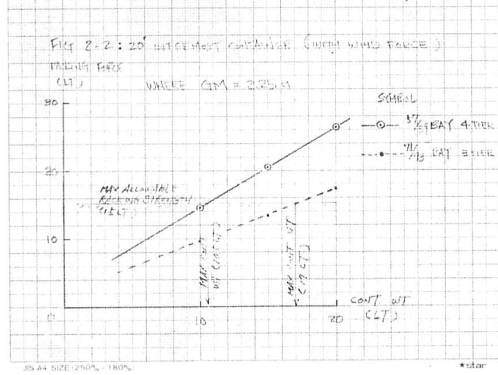


FIG 2.3 20' INNER CONTAINER (NO WIND FORCE)

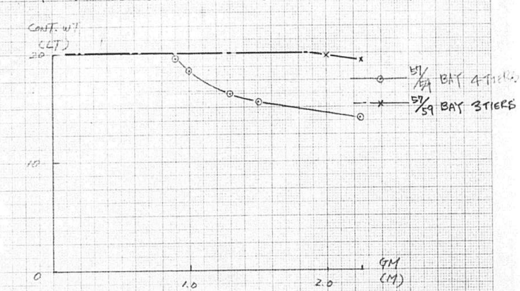
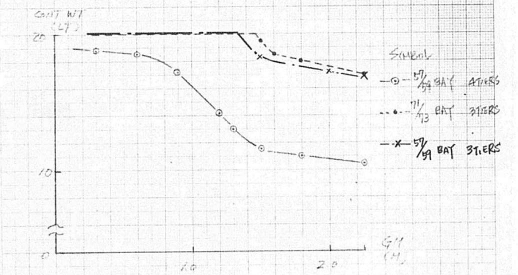


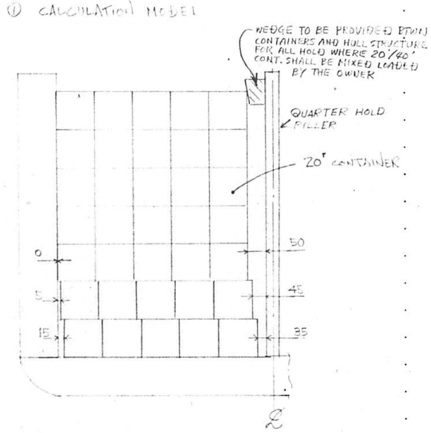
FIG 2.4 20' OVERHEAT CONTAINER (WITH WIND FORCE)



4.3 20' CONTAINER IN HOLD FOR MIXED LOADING BAY OF 20'/40' CONTAINERS.

4.3.1 STRENGTH CHECK OF CONTAINER

① CALCULATION MODEL



ABOVE MODEL IS CONSIDERED TO BE SEVEREST CONDITION ON RACKING STRENGTH OF CONTAINER. ... COMPRESSION FORCE ACTING AT EACH CONTAINER CORNER IS WITHIN STRENGTH LIMITATION OF CONTAINER.

② CALCULATION RESULT

MAX ALLOWABLE CONTAINER WEIGHT AT GM=2.25M EXCEPT BAY NO. (11,13,) 21.63.65 & 67 IS SHOWN ON FIG 3-1, AND RELATION BTWN MAX ALLOWABLE CONTAINER WEIGHT AND VARIOUS GM

EXCEPT BAY NO. (11, 13,) 61, 63, 65 & 67 IS SHOWN ON FIG 3-2.
CONTAINER WEIGHT EXCEPT BAY NO 61 63. 65 & 67 NEEDS TO BE REDUCED DEPENDED ON FIG 3-2. 20' CONT OF BAY NO (11, 13,) 61 63, 65 & 67 HAS ENOUGH STRENGTH UNDER CONDITION OF GM = 2.25M AND CONT WEIGHT = 20LT { SEE ALSO PAGE 32

CONTAINER WEIGHT OF BAY NO (11, 13,) 61, 63, 65 & 67 BAY CONTAINER DOES NOT NEED TO BE REDUCED.

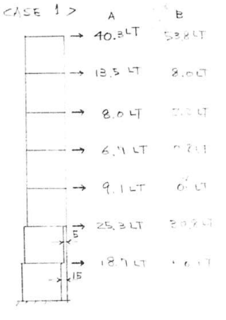
4.3.2 LOAD ON QUARTER HOLD CENTER PILLAR

○ CALCULATION MODEL & LOAD

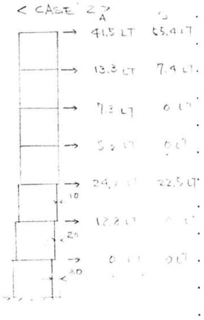
LOAD ON QUARTER HOLD CENTER PILLAR UNDER FOLLOWING CONDITIONS. THE VALUE SHOWS THE TOTAL AMOUNT OF THE LOAD INDUCED BY FORE OR AFT SIDE CONTAINERS.

NOTE A: IN CASE OF CONTAINER STIFFNESS OF DOOR SIDE
B: IN CASE OF CONTAINER STIFFNESS OF DOORLESS SIDE

<CASE 1>

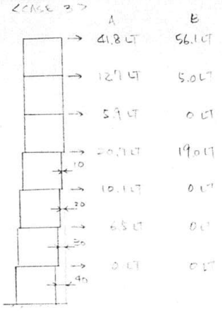


<CASE 2>

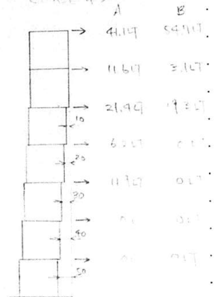


※ NOTE: ZERO MEANS THAT ... A GAP BETWEEN THE CONTAINER ...

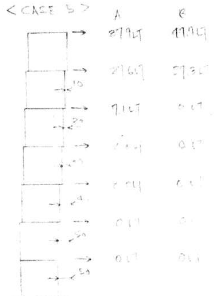
<CASE 3>



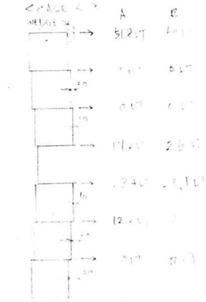
<CASE 4>



<CASE 5>



<CASE 6>



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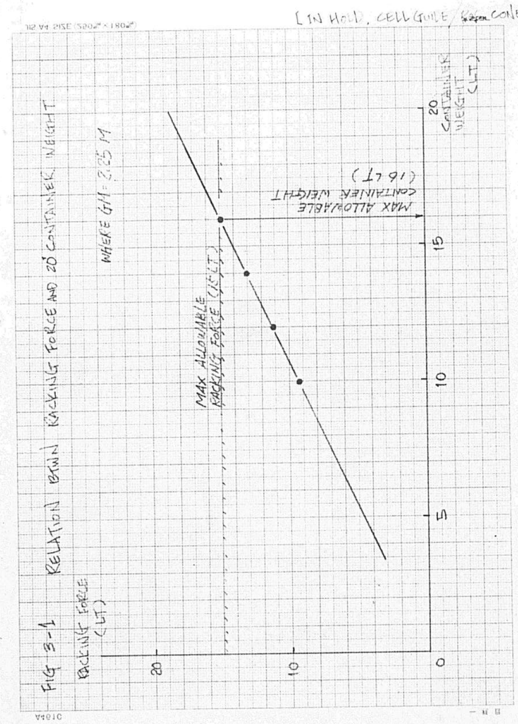
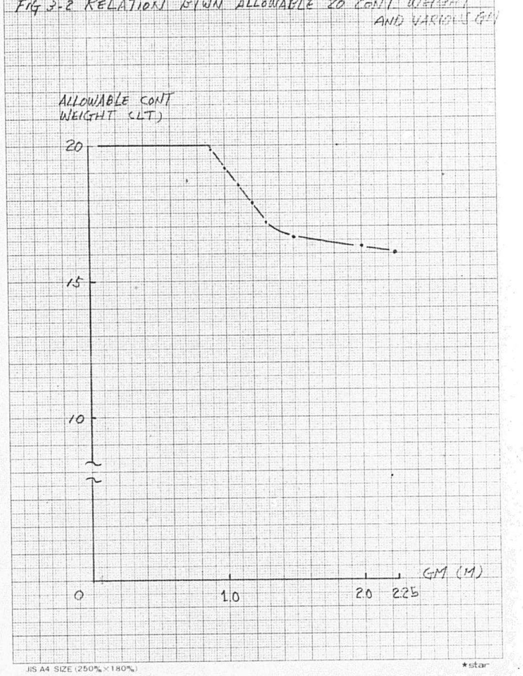


FIG 3-1 RELATION BTWN RACKING FORCE AND 20' CONTAINER WEIGHT

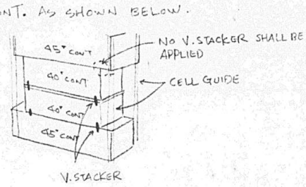
FIG 3-2 RELATION BTWN ALLOWABLE 20' CONT WEIGHT AND VARIOUS GM



4.4 MIXED LOADING OF 40' AND 45' CONTAINER IN HOLD

① CALCULATION MODEL

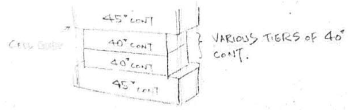
- NO VERTICAL STACKER SHALL BE APPLIED BTWN UPPER END OF 40' CONT. AND LOWER END OF 45' CONT. AS SHOWN BELOW.



- FOLLOWING 2 CASE STUDIES SHALL BE EXAMINED ON VARIOUS TIERS OF 40' CONT. WHICH SHALL BE SANDWICHED BY 45' CONTAINERS OR HULL STRUCTURE (TANK TOP)

CASE 1

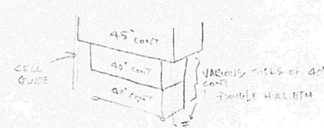
- 40' CONT. SHALL BE SANDWICHED BY 45' CONT.



- IN THIS CASE, WEIGHT LIMITATION OF 40' CONTAINER SANDWICHED BY 2-45' CONTAINERS SHALL BE DETERMINED BY RACKING FORCE OF 45' CONT. UNDER SOME SANDWICHED 40' CONTS.

CASE 2

- 40' CONT. SHALL BE SANDWICHED BY 45' CONT. AND HULL STRUCTURE



- IN THIS CASE, WEIGHT LIMITATION OF 40' CONTAINER SANDWICHED BY 45' CONT. AND DOUBLE HULL BTM. SHALL BE DETERMINED BY RACKING FORCE OF LOWERMOST 40' CONT.

② RESULT

WEIGHT LIMITATION OF SANDWICHED 40' CONT IN RELATION TO VARIOUS GM ARE SHOWN IN FOLLOWING FIG 4-1 ~ 4-11.

<FIG INDEX>

FIG	BAY No.	TIER OF SANDWICHED 40' CONT	
4-1	12	1	EVERY FIG SHOWS BOTH CASE 1 AND 2. SAID BEFORE.
4-2	"	2	
4-3	"	3	
4-4	"	4	
4-5	12	5	
4-6	34	1	
4-7	"	2	
4-8	"	3	
4-9	"	4	
4-10	"	5	
4-11	34	6	

BAY No. 12

FIG 4-1

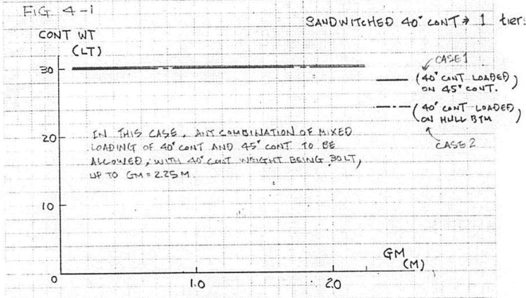
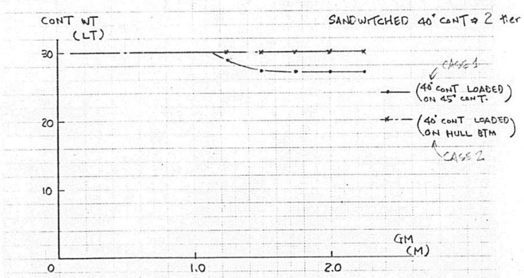


FIG 4-2



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FIG 4-3

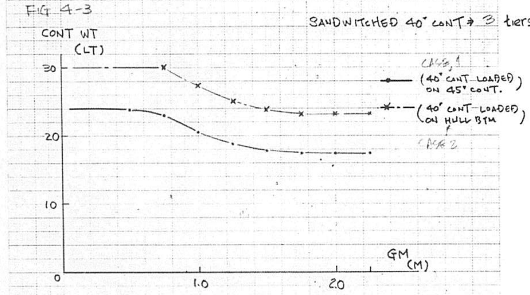
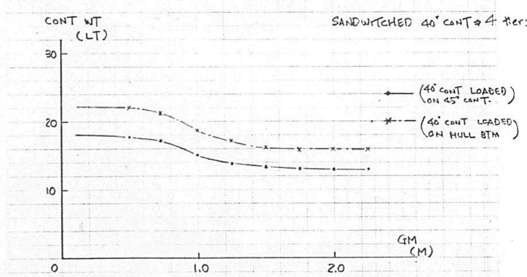
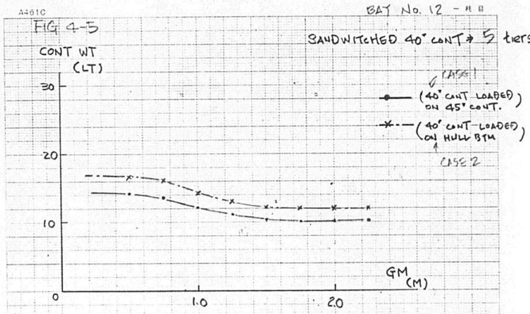


FIG 4-4



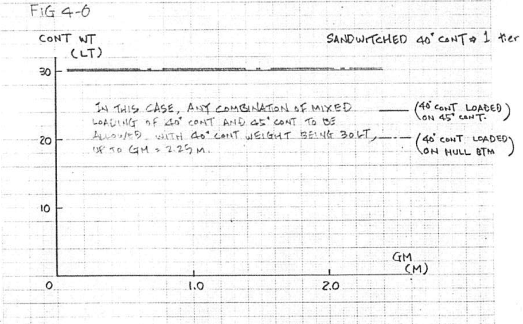
22/

FIG 4-5



BAY No. 34

FIG 4-6



23/

BAY No. 34

FIG 4-7

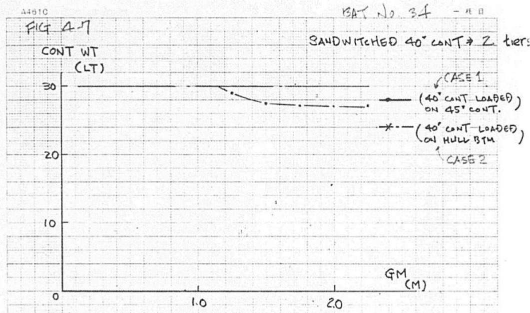
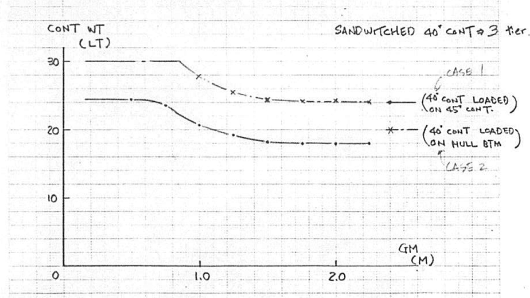


FIG 4-8



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FIG 4-9

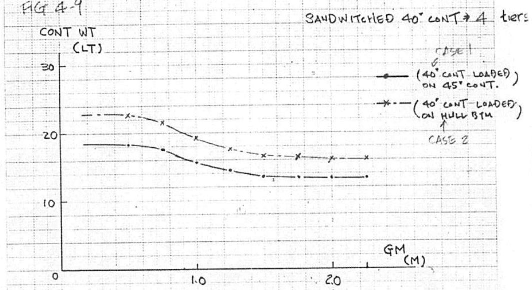


FIG 4-10

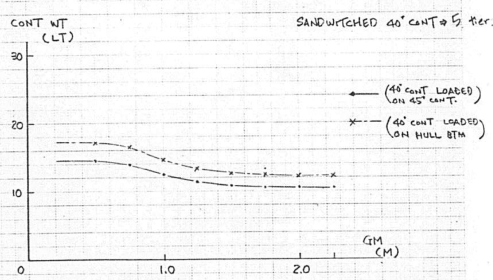
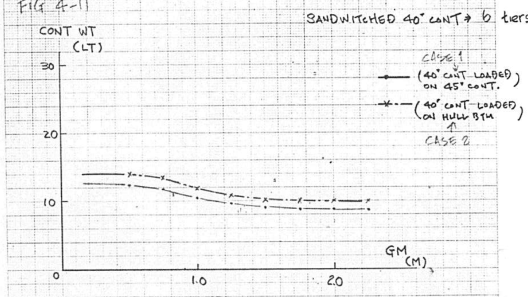
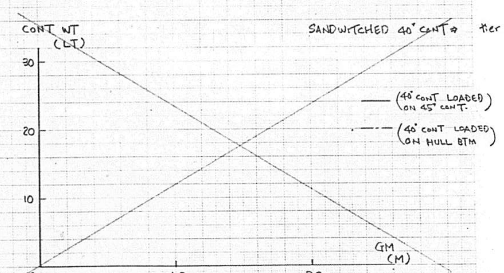


FIG 4-11

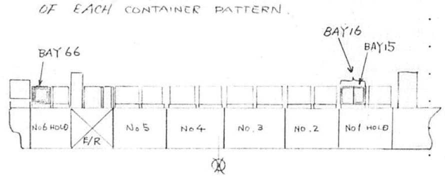




5. STRENGTH CAL. OF LASHING ROD FOR CONTAINER ON DECK.

5.1 CALCULATION CASE

THE FOLLOWING SIX (6) CASES SHOULD BE INVESTIGATED FOR THE SEVEREST POSITION OF EACH CONTAINER PATTERN.



CASE	CONTAINER PATTERN	BAY No	WIND LOAD	NUM. OF ROD
1)	20' × 3 TIERS	15	NO (LEEWARD SIDE)	1
2)	〃	15	YES	2
3)	40' × 3 TIERS	16	NO (LEEWARD SIDE)	1
4)	〃	66	YES	2
5)	45' × 3 TIERS	16	YES	2
6)	45' × 2 TIERS + 40' × 1 TIER	66	YES	2

THE ABOVE ALL THE CONTAINERS ARE LOCATED AT OUTER MOST POSITION.

5.2 CALCULATION CONDITION

IN THIS CAL, THE FOLLOWING MAX. GM FOR EACH CONTAINER LOADING PATTERN WITHOUT WEIGHT REDUCTION HAS BEEN USED.

REFER TO ORIGINAL CALCULATION SHEET ON DWG. 4109330.

CONTAINER PATTERN	GM (M)
20' × 3 TIERS	2.25
40' × 3 TIERS	1.90
45' × 3 TIERS	1.36
45' × 2 TIERS + 40' × 1 TIER	1.45

5.3 RESULT.

CASE	Lash. No.	Lash. Tens. (MTON)	Hori. comp. (MTON)
1)	3.	19.48	12.78
2)	1. 2.	12.14 12.74	7.96 8.01
3)	3.	29.71	17.88 ← MAX.
4)	1. 2.	18.85 19.77	12.36 12.44
5)	1. 2.	19.34 20.01	11.64 11.48
6)	1. 2.	18.82 19.74	12.35 12.42

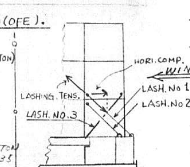
PARTICULAR OF LASHING ROD (OFE).
REF: OWNER'S TLX No. 1039

- BREAK LOAD 500 KN (51 MTON)
- DIAMETER 26 MM

ACC TO DNV RULE PT5, CH2, SEC 6 - G200,

ACTUAL WORK. LOAD 29.71 TON < REQUIRED BY DNV RULE 51 TON × 0.85 × 0.70 = 30.35 TON

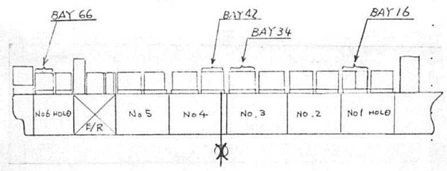
OK



6. ALLOWABLE CONTAINER WEIGHT VS. VERIOUS GM

RESULTS

THE FOLLOWING FIGURES (6-1, 6-2 & 6-3) SHOW THAT THE DIFFERENCE OF THE ALLOWABLE CONTAINER WEIGHTS FOR DIFFERENT LOCATIONS ALONG THE SHIP AGAINST THE THREE PATTERN OF CONTAINER LOADING.



[ON DECK, LASHING SYSTEM]

ALLOWABLE CONT. WEIGHT ON VARIOUS GM

FIG 6-1

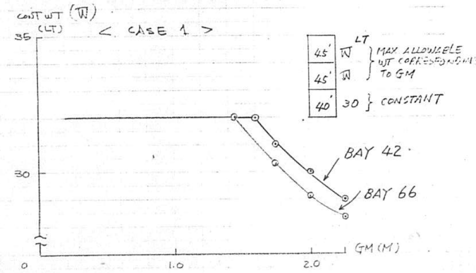
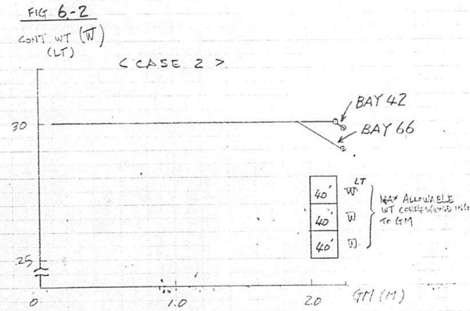
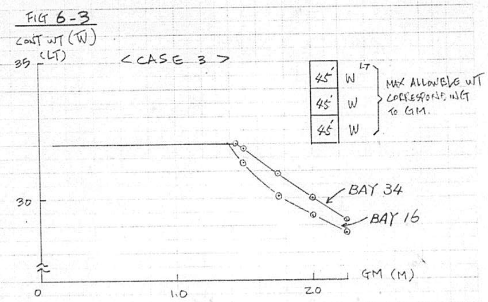


FIG 6-2



[ON DECK, LASHING SYSTEM]

FIG 6-3



NOTE :

WEIGHT LIMITATIONS FOR EACH CONTAINER LOADING PATTERN ON DECK HAS BEEN EVALUTED AT THE SEVEREST POSITION WHICH ARE LOCATED AT BAY 16 AND 66 AS SHOWN.

WEIGHT LIMITATIONS FOR CONTAINES NEAR THE MIDSHIP (BAY 42 AND 34) WILL BE LIGHTEN SLIGHTLY AS SHOWN BECAUSE THE EFFECT OF YAW MOMENT IS SMALL. BUT THESE DEFERENCES ARE NOT MORE THAN 1.0 LT.

7. 20' CONTAINER IN HOLD FOR MIXED LOADING BAY OF 20'/40' CONTAINERS.

7.1 ALLOWABLE WEIGHT LIMITATIONS OF 20' CONTAINERS STOWED IN 40' CELL GUIDES HAVE BEEN INVESTIGATED FOR NO 2 HOLD FWD (BAY 21) AND NO3 HOLD FWD (BAY 31) ADDITIONALLY.

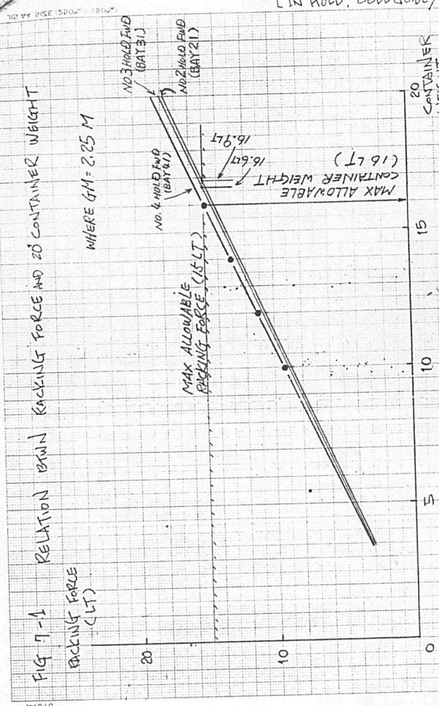
AS SHOWN ON FIG. 7-1 & 7-2, MAX. ALLOWABLE CONTAINER WEIGHTS IN EACH 2 AND 3 HOLD FWD ARE 16.9LT AND 16.6 LT UNDER CONDITION OF GM = 2.25 M RESPECTIVELY. HOWEVER, CONTAINER WEIGHT LIMITATION IN NO 2, 3 AND 4 HOLD FWD REGARDS AS 16LT IN CONSIDERATION OF THE SEVEREST LIMITATION OF 16LT IN No. 4 HOLD FWD, WHICH PLEASE ACCEPT AND NOTE.

7.2 ALLOWABLE WEIGHT LIMITATIONS OF CONTAINERS IN No. 1 HOLD (BAY 11 & 13) AND No. 6 HOLD (BAY 61, 63, 65 & 67) ARE NOT NECESSARY, BECAUSE MAX. RACKING FORCES UNDER THE CONDITION OF GM = 2.25 M ARE AS FOLLOWS.

		MAX. RACKING FORCE	
IN No.1 HOLD		6.8LT	< 15 LT (OK)
" No 6 "	"	9.6LT	< 15 LT (OK)

THEREFORE, 20 LT PER TEU IS ALLOWED AND QUARTER HOLD PILLER IS NOT NECESSARY.

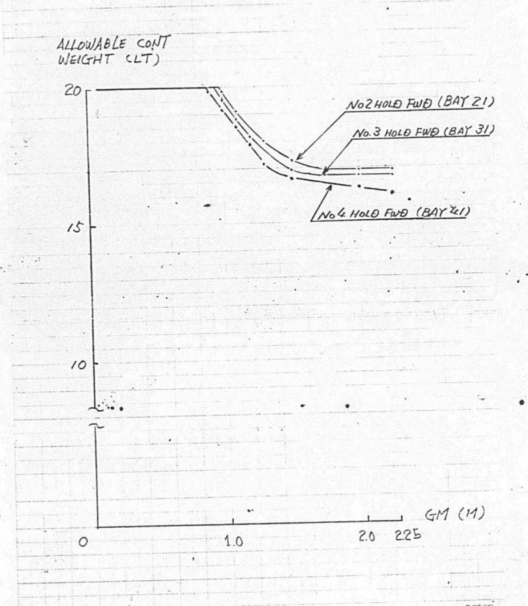
[IN HOLD, CELL GUIDE/POS. CONE]



33/

[IN HOLD, CELL GUIDE/POS. CONE]

FIG 7-2 RELATION BTWN ALLOWABLE 20' CONT. WEIGHT AND VARIOUS GM



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APPROVAL OF OWNER & REGULATORY BODIES

ALT.NO.	OWNER DATE	OWNER LETTER NO.	USCG DATE	USCG LETTER NO.	ABS DATE	ABS LETTER NO.	USPH DATE	USPH LETTER NO.
ORIGINAL	[illegible]	[illegible]						

FINISHED PLAN

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SHIPYARD AND SHIP'S NO. & NAME

MITSUI TAMANO		MITSUBISHI KOBE	
NO.1323	DOCTOR LYKES	NO.1158	JAMES LYKES
NO.1324	ALMERIA LYKES	NO.1159	JOSEPH LYKES
NO.1325	TILLIE LYKES	NO.1164	SOLON TURMAN

MITSUI ENGINEERING & SHIPBUILDING CO.,LTD.
TAMANO WORKS

SHIP DESIGN DEPARTMENT — SHIP'S NO. **NO.1325** — SHIP'S NAME **TILLIE LYKES**

HULL OUTFIT DESIGN SEC

HOLD 内 コンテナ 用 ステージ
STAGE FOR CONTAINER IN HOLD

DATE (TEL 2235)

JOB NO. TS1323/24/25 — SCALE 1/100 — LYKES REF. NO. 270007 — MITSUI DRAWING NO. 4104342 R

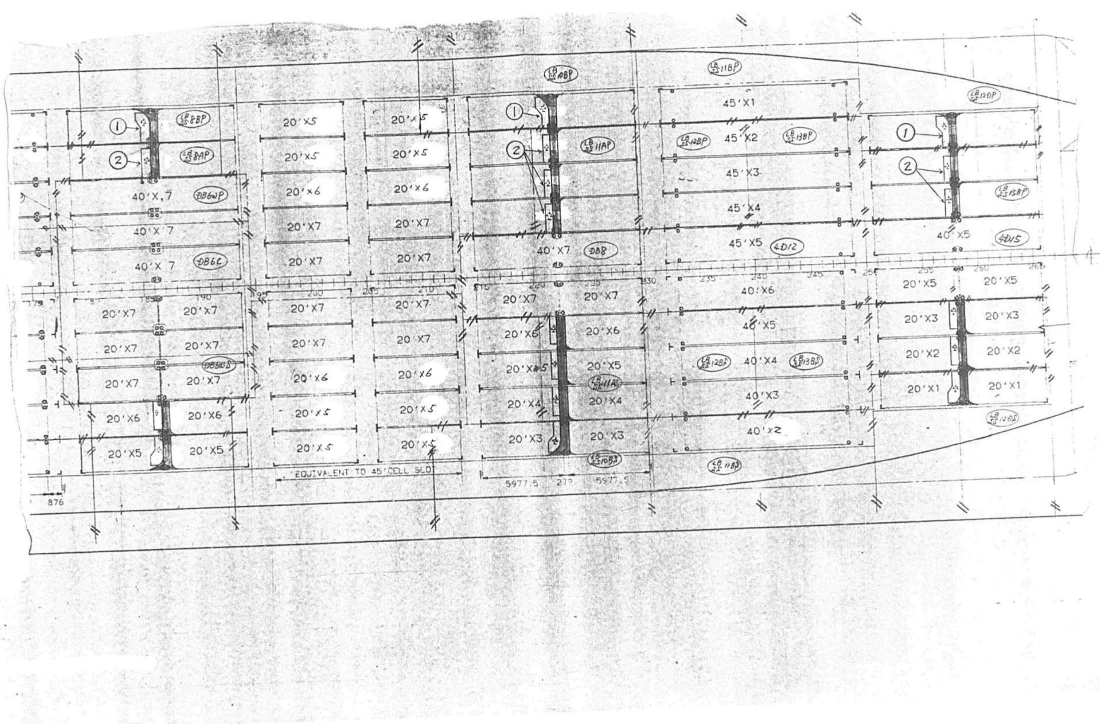
(4 SHEETS WITH COVER) 1/4

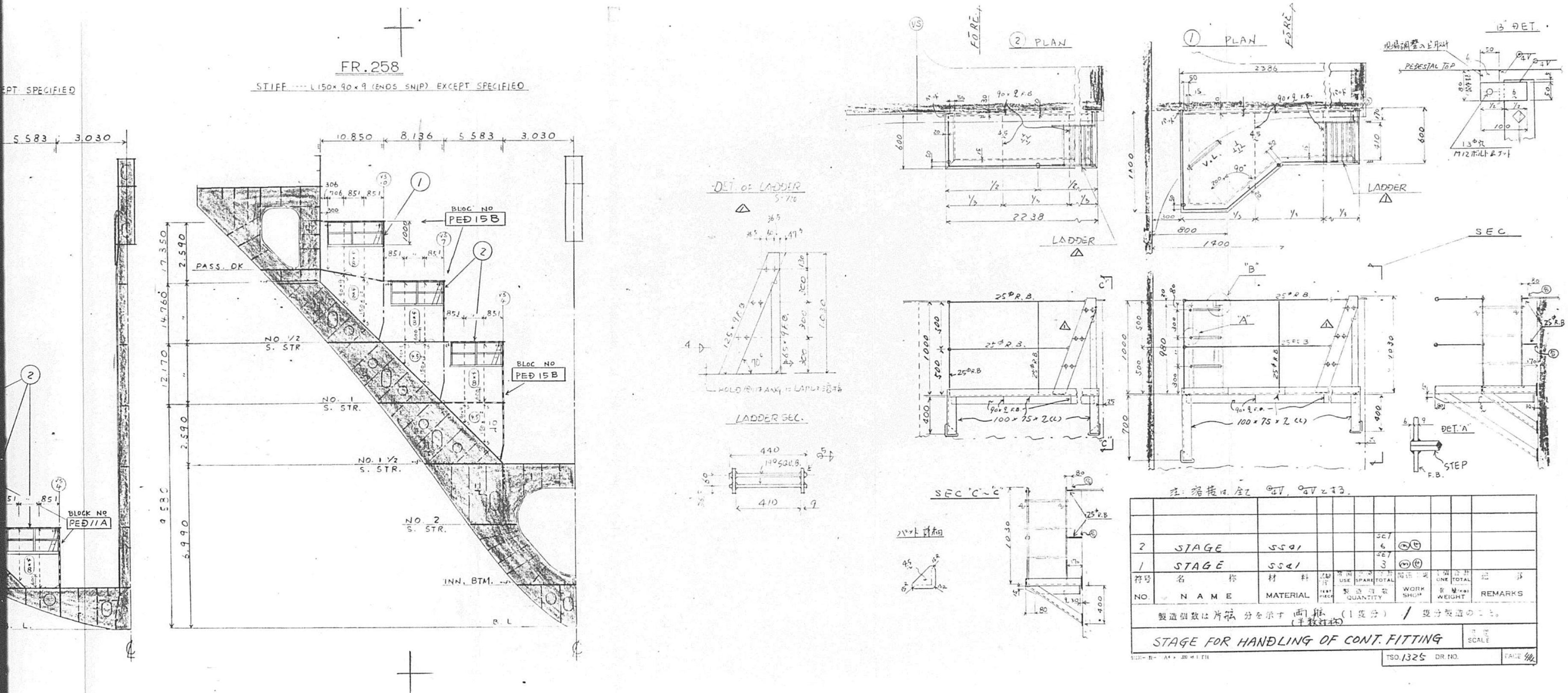
PLAN RECORD

ALT.NO.	MARK	ALTERATION/DESCRIPTION	DATE & SIGNATURE
		PREPARED FOR S.NO. 1323 AS FINISHED PLAN.	NOVEMBER 26,84
		CHANGED AS FOLLOW.	
		△ CHANGE FOR LADDER.	
		MADE APPLICABLE TO SNO 1325.	[illegible]

DWG.NO. 4104342 — P. 3/4

ARR of STAGE FOR CONTAINER IN HOLD
コンテナ積付用プラットホーム配置





注: 溶接は全て ⊙4V, ⊙4V とする.

2	STAGE	SS41				SET 6	㋱㋝			
1	STAGE	SS41				SET 3	㋱㋝			
符号 NO.	名称 NAME	材料 MATERIAL	試験片 TEST PIECE	常備 USE	予備 SPARE	合計 TOTAL	関係工場 WORK SHOP	1個 ONE	合計 TOTAL	記事 REMARKS
				製造個数 QUANTITY				重量(kg) WEIGHT		

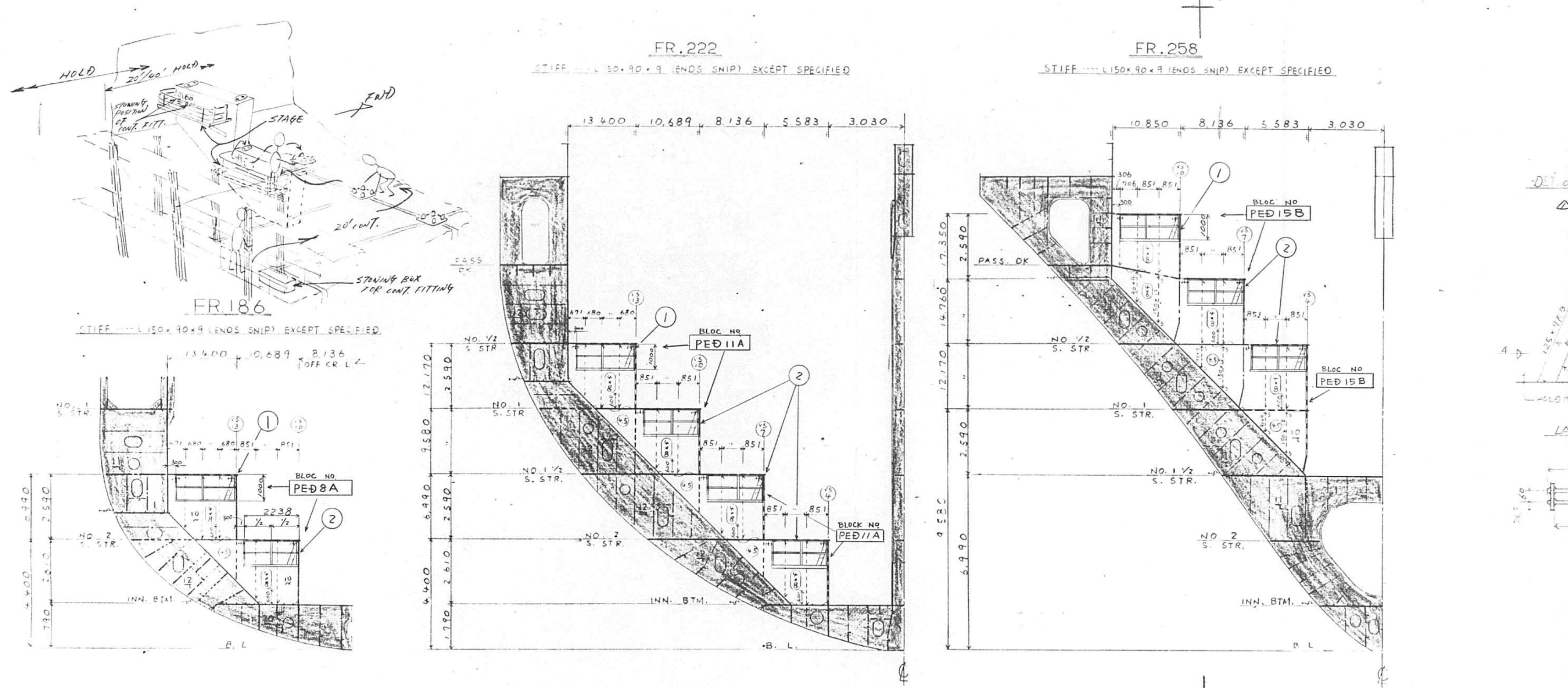
製造個数は片舷分を示す 両舷（半数対称）（1隻分）/ 隻分製造のこと。

STAGE FOR HANDLING OF CONT. FITTING — 尺度 SCALE

TSO.1325 DR. NO. — PAGE 4/4

1/2

1080



5-20(1×1)

2/2

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APPROVAL OF OWNER'S & REGULATORY BODIES

ALT.NO.	OWNER DATE	OWNER LETTER NO.	USCG DATE	USCG LETTER NO.	ABS (FOR REFERENCE) DATE	ABS LETTER NO.	USPH DATE	USPH LETTER NO.
ORIGINAL	DEC. 12. 1985	OFFLMES 1111			23 JAN '86	TT/my 7-8-3		

FINISHEDPLAN

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SHIPYARD AND SHIP'S NO. & NAME			
MITSUI TAMANO		MITSUBISHI KOBE	
NO.1323	DOCTOR LYKES	NO.1158	JAMES LYKES
NO.1324	ALMERIA LYKES	NO.1159	JOSEPH LYKES
NO.1325	TILLIE LYKES	NO.1164	SOLON TURMAN

MITSUI ENGINEERING & SHIPBUILDING CO., LTD.
TAMANO WORKS

SHIP DESIGN DEPARTMENT MANAGER — SHIP'S NO. **NO.1325** — SHIP'S NAME **TILLIE LYKES**

OUTFITTING DESIGN SECTION

STRENGTH CALCULATION OF CONTAINER LOADING (4 TIERS STACK ON DK)

MITSUI ENGINEERING & SHIPBUILDING CO., LTD. SHIP DESIGN DEPARTMENT NOV. 10. 1986

DATE (TEL: 2351)

JOB NO. TS1323/24/25 — JOBCLASSIF.NO. — SCALE — LYKES REF. NO. **270008** — MITSUI DRAWING NO. **4104331**

(15 SHEETS WITH COVER)

P. 1/15

PLAN RECORD

ALT. NO.	MARK	ALTERATION/DESCRIPTION	DATE & SIGNATURE
1		PREPARED FOR S.NO. 1323 AS FINISHED PLAN, MADE APPLICABLE TO S.NO.1324 AND S.NO.1325.	NOVEMBER. 20. 86' (S.K.)

DWG.NO. 4104331

P. 2/15

1 GENERAL

THIS SHEET SHOWS THE CALCULATION OF THE ALLOWABLE CONTAINER WEIGHT IN CASE OF 4 TIERS STACK CONTAINER LOADING ON DECK EXCEPT ON-DECK-CELL GUIDE CONT. LOADING BAY (55, 57, 58, 59, 71, 72 & 73 BAY).

THE CALCULATION HAS BEEN DONE ACCORDING TO OWNER'S EXTRA REQUIREMENT. AND ALSO THE CALCULATION HAS BEEN DONE SO THAT EXSISTING SHIP DESIGN SHALL NOT BE CHANGED (i.e. LOAD ON HATCH COVER WILL NOT BE CHANGED BY ADDITIONAL CONTAINER LOADING PATTERN, 4 TIERS STACK LOADING).

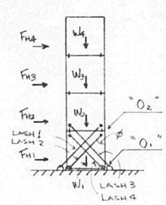
2 CALCULATION FORMULAR.

IN THIS CALCULATION FOLLOWING CONCEPTION SHALL BE ADDED TO CONCEPTION OF PREVIOUSLY SUBMITTED CALCULATION SHEET "STRENGTH CALCULATION OF CONTAINER LOADING" (DWG NO 4104330), WHICH IS BASED ON "NV FORMULAR".

< ADDED CONCEPTION >

IF CONTAINER STACK WILL BE 4 TIERS, CONTAINER OVERTURNING PROBLEM WILL BE SIGNIFICANT. SO IN THIS CALCULATION ABOVE EFFECT HAS BEEN INCUDED AS SHOWN BELOW.

FIG 3-1



SYMBOLS

- F_{Hi} : HORIZONTAL FORCE ACTING ON i TIER CONTAINER
- W_i : CONTAINER WEIGHT OF i TIER CONTAINER
- LHT_i : HORI. COMP OF LASHING TENSION OF i LASH
- ΔLHT_i : INCREMENT OF HORI COMP OF LASHING TENSION OF i LASH
- CB : BREADTH OF CONTAINER
- CH : HEIGHT OF CONTAINER
- ϕ : ANGLE OF LASHING ROD.
- φ : ROLLING ANGLE

i) EQUILIBRUIM ON POINT "O_1"

FOLLOWING EQUATION TO BE CONSIDERED

$$\sum_{i=1}^{4} W_i \times \frac{CB}{2} \times \cos\varphi + 2 \times \sum_{i=1}^{2} (LHT_i + \Delta LHT_i) \times CH - \sum_{i=1}^{4} F_{Hi} \times (i-1+0.25) \times CH = 0$$

⬇

$$\sum_{i=1}^{2} (\Delta LH_i) = \frac{\sum_{i=1}^{4} F_{Hi}(i-1+0.25) \times CH - \sum_{i=1}^{4} W_i \times \frac{CB}{2} \times \cos\varphi}{2 \times CH} - \sum_{i=1}^{2} LHT_i$$

AS SHOWN ABOVE, INCREMENT OF LASHING TENSION OF LASH 1, 2 SHALL BE CONSIDERED.

WHERE : IF $\Delta LH_i < 0 \Rightarrow$ LET $\Delta LH_i = 0$

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ii) EQUILIBRUIM ON POINT "O2"

FOLLOWING EQUATION TO BE CONSIDERED.

$$\sum_{i=2}^{4} W_i \times \frac{CB}{2} \times \cos\varphi + 2 \times (LHT_3 + \Delta LHT_3) / \tan\phi \times CB - \sum_{i=2}^{4} F_{Hi}(i-2+0.25) \cdot C_H = 0$$

⬇ (WHERE LHT3 = 0)

$$\Delta LHT_3 = \frac{\sum_{i=2}^{4} W_i \times \frac{CB}{2} \times \cos\varphi - \sum_{i=2}^{4} F_{Hi}(i-2+0.25) C_H}{2 \times CB} \times \tan\phi$$

AS SHOWN ABOVE, INCREMENT OF LASHING TENSION OF LASH 3 TO BE CONSIDERD, BUT IN ACTUAL THIS VALUE IS NOT SO LARGE. SO IN THIS CALCULATION ΔLHT3 SHALL BE NEGLECTED.

3. DESIGN CONDITION

3.1 SHIP MOTION

SAME AS DWG OF 『STRENGTH CALCULATION OF CONTAINER LOADING 』 (DWG No. 4104330)

3.2 CONTAINER WEIGHT

i) EMPTY CONTAINER WEIGHT (LIGHT WEIGHT)

① 45' CONTAINER : 5 MTON
② 40' 〃 : 3.5 MTON
③ 20' 〃 : 2.3 MTON

3.3 CRITICAL VALUE

IN ADDITION TO CRITICAL VALUE IN 『STRENGTH CALCULATION OF CONTAINER LOADING 』 (DWG No. 4104330), FOLLOWING CRITICAL VALUE SHALL BE ADOPTED TO AVOID EXSISTING DESIGN (e.i LOAD ON HATCH COVER)

IN EXISTING DESIGN, LOAD ON OTHER STRUCTURE IS 90 MTON.

SO 90 MTON SHALL BE TREATED AS ADDITIONAL CRITICAL VALUE IN THIS CALCULATION SHEET.

* EQUATION OF LOAD (LF) ON OTHER STRUCTURE

$$LF = \frac{\sum_{i=1}^{4} F_{Hi}(i-1+0.25) \times C_H - \sum_{i=1}^{4} W_i \cdot \frac{CB}{2} \times \cos\varphi - 2\sum_{i=1}^{2}(LHT_i + \Delta LHT_i) \times C_H}{CB}$$

$$+ 2\sum_{i=1}^{2}(LHT_i + \Delta LHT_i) / \tan\varphi$$

4 CALCULATION CASE

FOLLOWING CASES ARE CALCULATED. THE OTHER CASES ARE TO BE INTERPOLATED OR EXTRAPOLATED.

TABLE 4-1

No.	BAY No.	LOADING PATTERN	DIST FROM MIDSHIP (M)
1	12	40' × 4 TIERS	85.2
2	12	45' × 3 + 40' × 1	Do.
3	16	45' × 4 TIERS	70.2
4	24	40' × 4 TIERS	55.7
5	24	45' × 3 + 40' × 1	Do.
6	26	45' × 4 TIERS	41.0
7	32	40' × 4 TIERS	26.0
8	32	45' × 3 + 40' × 1	Do.
9	15	20' × 4 TIERS	74.2
10	25	20' × 4 TIERS	44.8

IN ABOVE ALL CASES, CALCULATION HAS BEEN DONE AS FOLLOWS.

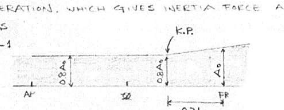
GM : 0.5, 1.0, 1.5, 2.0, 2.25 (MAX)

WIND LOAD : WITH / WITHOUT WIND LOAD.

<REF GUIDE>

IN NV FORMULAR, PROFILE OF YAW-SWAY COMBINED ACCELERATION, WHICH GIVES INERTIA FORCE ARE AS FOLLOWS

FIG 4-1



SO ALLOWABLE CONTAINER WEIGHT SHALL VARY LINEARLY AS ABOVE PROFILE SHALL VARY, SIMILARILY.

5 CALCULATION RESULT

CALCULATION RESULT ARE SHOWN ON AS FOLLOWS.

TABLE 5-1

No.	BAY No.	LOADING PATTERN	FIG No.	PAGE
1	12	40' × 4	FIG 5-1	8
2	12	45' × 3 + 40' × 1	↑ 5-2	8
3	16	40' × 4	5-3	9
4	16	45' × 4	5-4	9
5	24	40' × 4	5-5	10
6	24	45' × 3 + 40' × 1	5-6	10
7	26	40' × 4	5-7	11
8	26	45' × 4	5-8	11
9	32	40' × 3	5-9	12
10	32	45' × 3 + 40' × 1	5-10	12
11	15	20' × 4	5-11	13
12	17	20' × 4	↓ 5-12	13
13	25	20' × 4	FIG 5-13	14

BAY WHICH IS NOT SPECIFIED IN TABLE 5-1 TO BE REFERD AS FOLLOWS.

① "40' × 4" LOADING IN AFTWARD BAY FROM 32 BAY TO BE SAME AS "40' × 4" LOADING IN 32 BAY.

② "45' × 4" LOADING IN AFTWARD BAY FROM 26 BAY TO BE SAME AS "45' × 4" LOADING IN 26 BAY.

③ "45' × 3 + 40' × 1" LOADING IN AFTWARD BAY FROM 32 BAY TO BE SAME AS "45' × 3 + 40' × 1" LOADING IN 32 BAY.

FIG 5-1 (12 BAY)

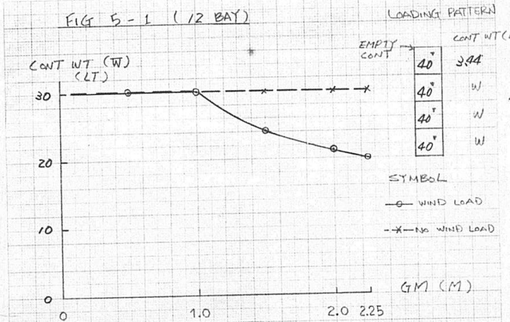


FIG 5-2 (12 BAY)

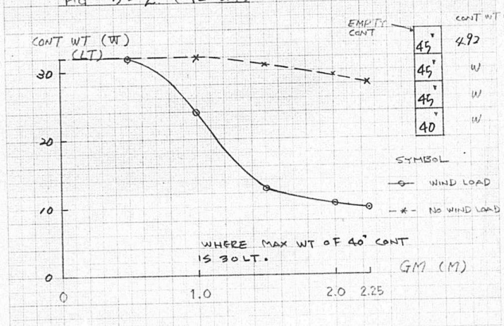


FIG 5-3 (16 BAY)

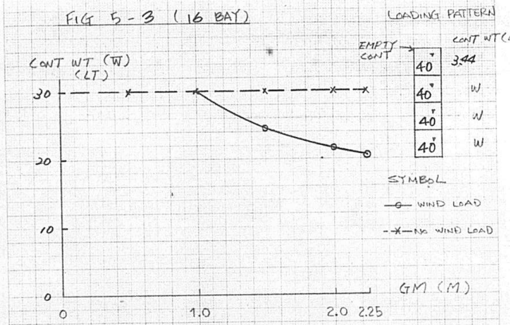


FIG 5-4 (16 BAY)

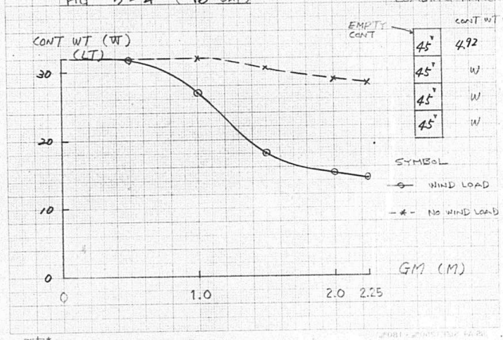


FIG 5-5 (24 BAY)

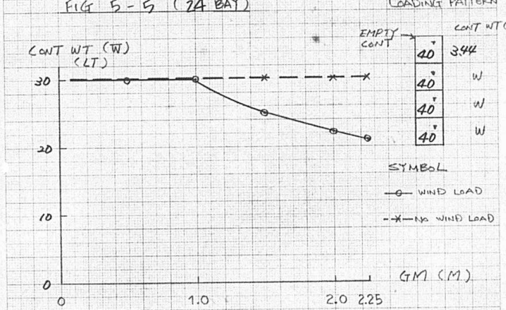


FIG 5-6 (24 BAY)

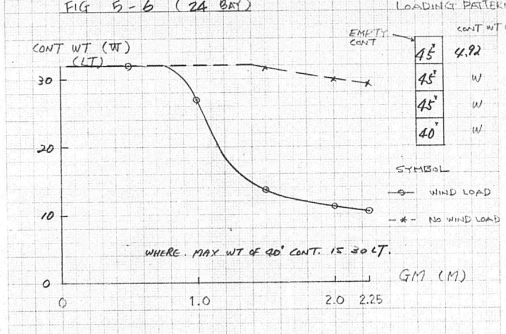


FIG 5-7 (26 BAY)

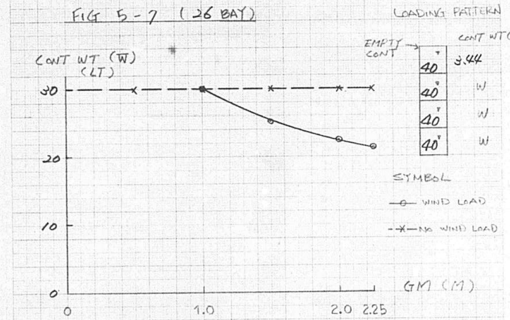


FIG 5-8 (26 BAY)

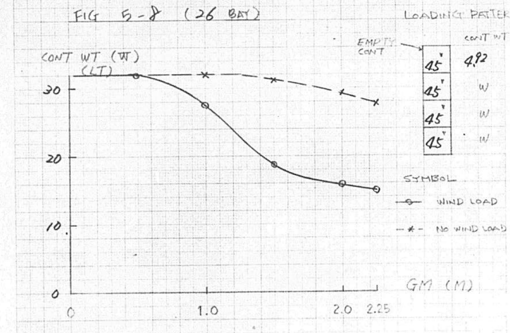


FIG 5-9 (32 BAY)

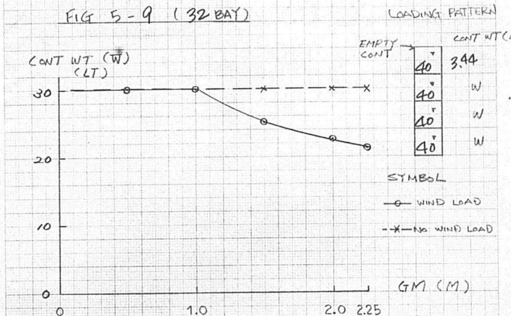
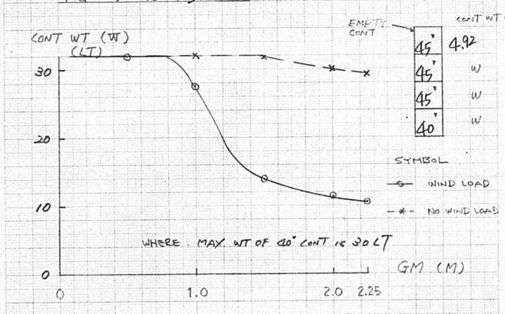


FIG 5-10 (32 BAY)



TS1323/6/c YR.NO.4104331 P. 13/15

FIG 5-11 (15 BAY)

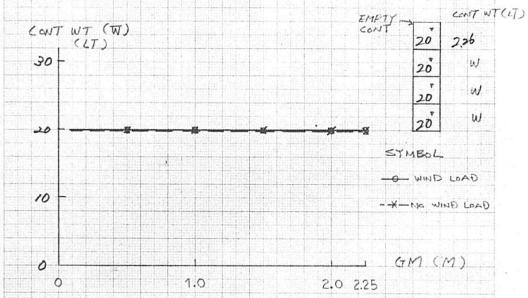
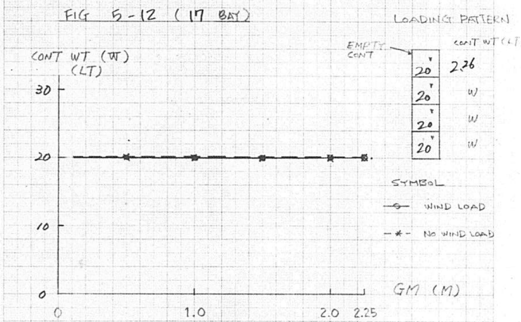


FIG 5-12 (17 BAY)



TS1323/6/c YR.NO.4104331 P. 14/15

FIG 5-13 (25 BAY)

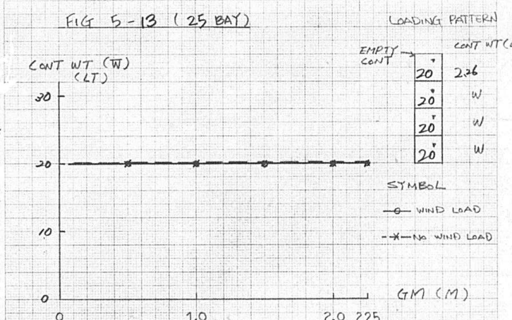
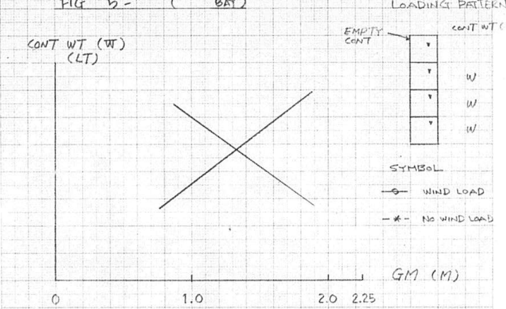


FIG 5- (BAY)



TS1323/6/c YR.NO.4104331 P. 15/15

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APPROVAL OF OWNER & REGULATORY BODIES								
ALT.NO.	OWNER		USCG		ABS		USPH	
	DATE	LETTER NO.	DATE	LETTER NO.	DATE	LETTER NO.	DATE	LETTER NO.
ORIGINAL								
REV.-1	SEP.10 1986	ATS/...1196						

FINISHEDPLAN

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SHIPYARD AND SHIP'S NO. & NAME			
MITSUI TAMANO		MITSUBISHI KOBE	
NO.1323	DOCTOR LYKES	NO.1158	JAMES LYKES
NO.1324	ALMERIA LYKES	NO.1159	JOSEPH LYKES
NO.1325	TILLIE LYKES	NO.1164	SOLON TURMAN

MITSUI ENGINEERING & SHIPBUILDING CO.,LTD.
TAMANO WORKS

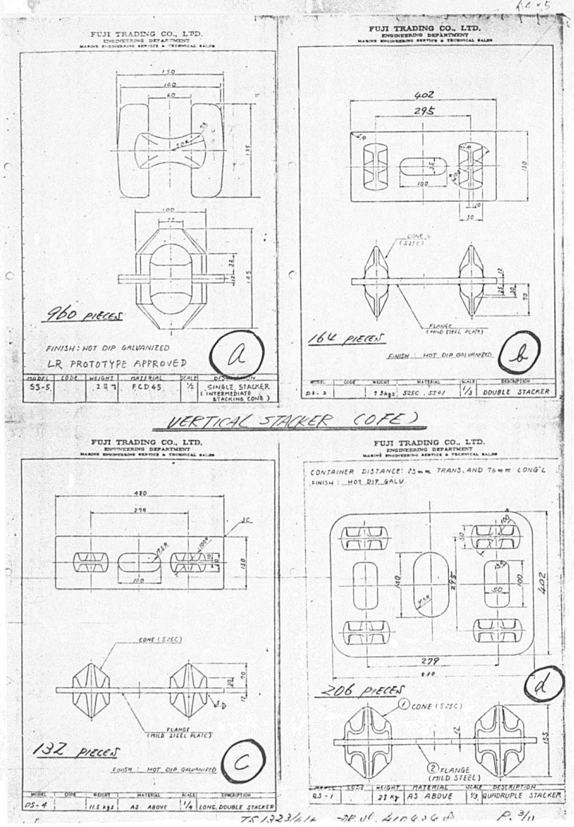
SHIP DESIGN DEPARTMENT	SHIP'S NO.	SHIP'S NAME
MANAGER	NO.1325	TILLIE LYKES
OUTFITTING DESIGN SECTION SEC.CHIEF	ARR. OF STOWAGE BOX FOR CONT. LOOSE FITTING (IN HOLD)	
DATE (TEL.3232)		
JOB NO. TS1323/24/25 JOBCLASSIF.NO. SCALE	LYKES REF. NO. 270009	MITSUI DRAWING NO. 4104348

(11 SHEETS WITH COVER)

P. 1/11

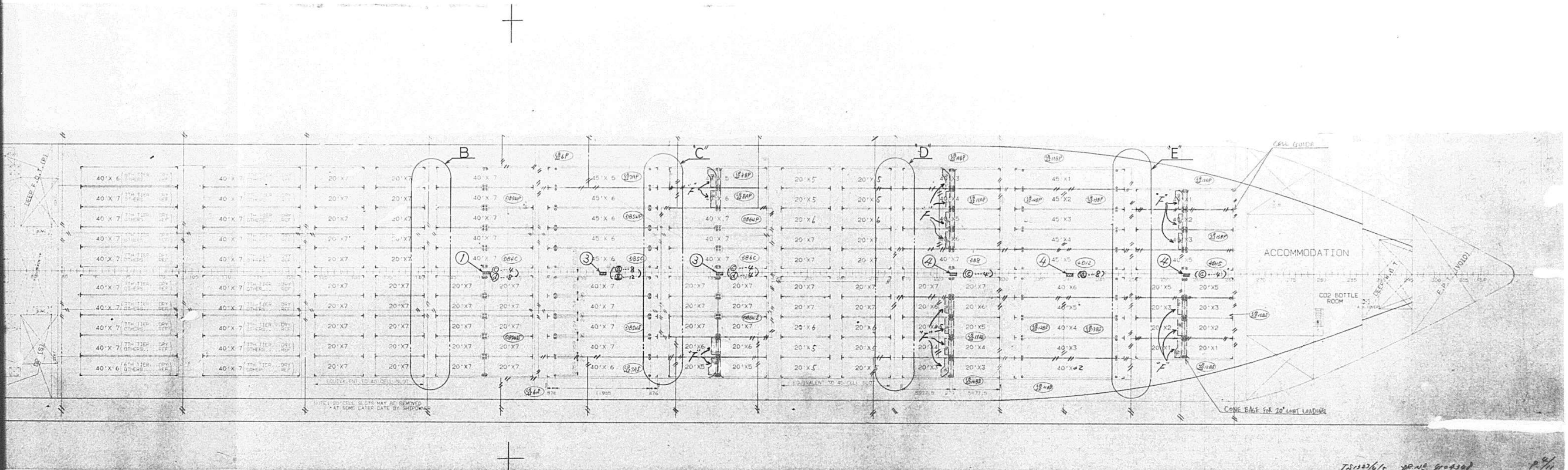
PLAN RECORD			
ALT.NO.	MARK	ALTERATION/DESCRIPTION	DATE & SIGNATURE
1		PREPARED FOR S.NO. 1323 AS FINSHED PLAN, MADE APPLICABLE TO S.NO.1324 AND S.NO.1325.	NOVEMBER.20.'86

TS 1323/4/5 DWG.NO. 4104348

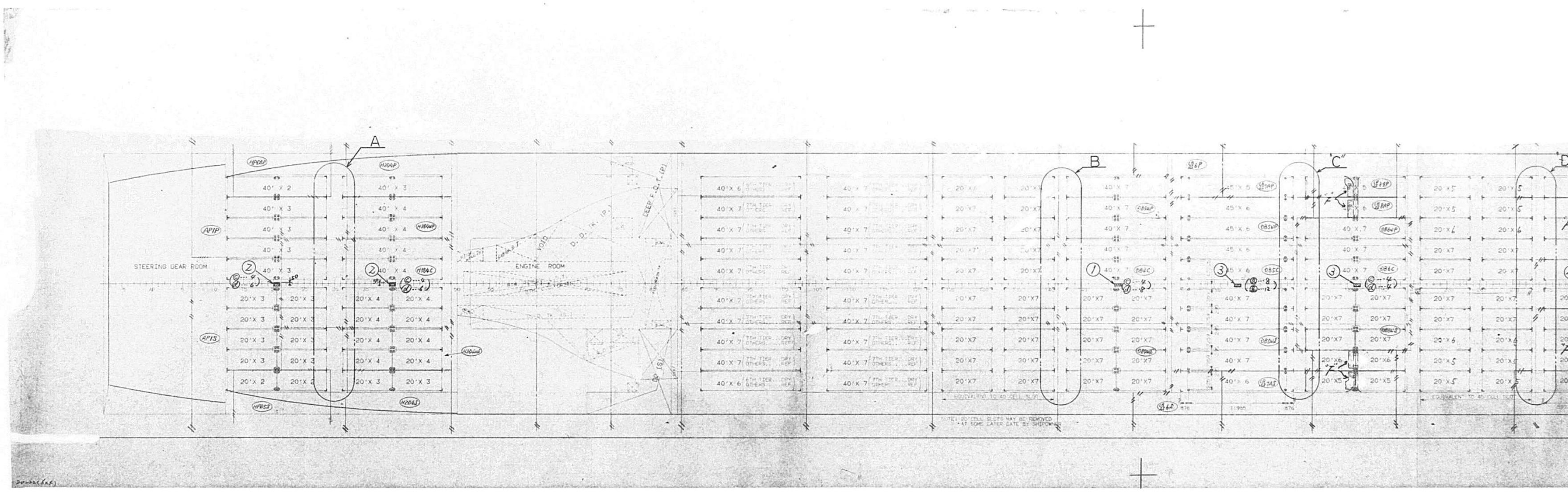


TS 1323/4/5 DR.NO. 4104348 P. 2/11

1086

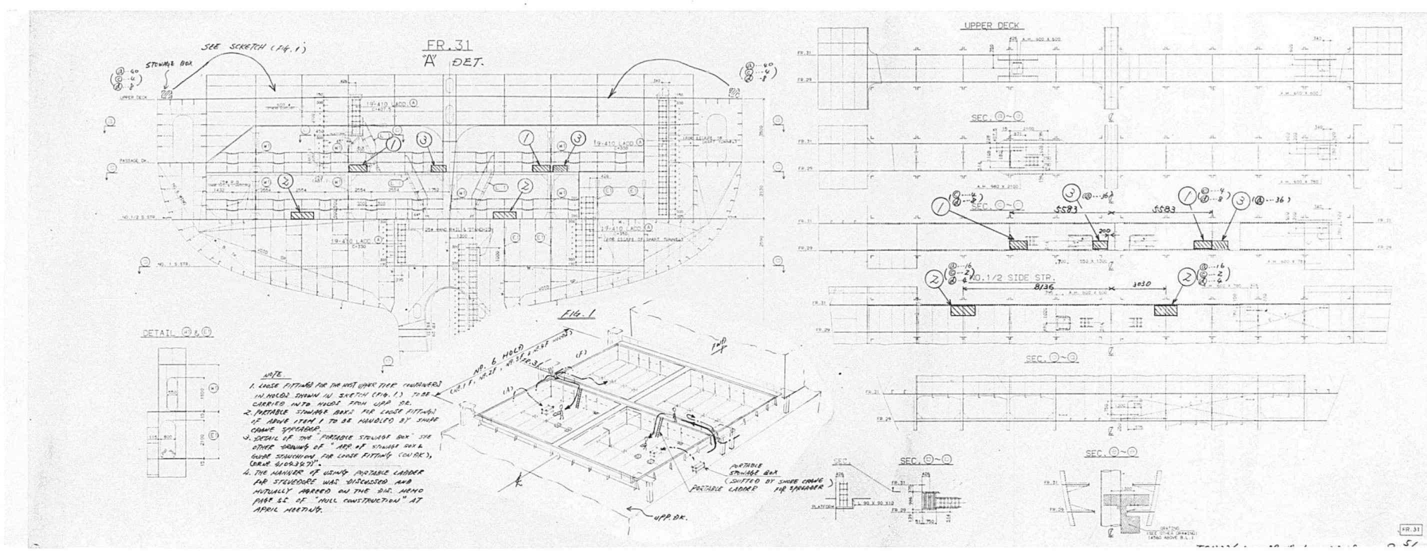


1087

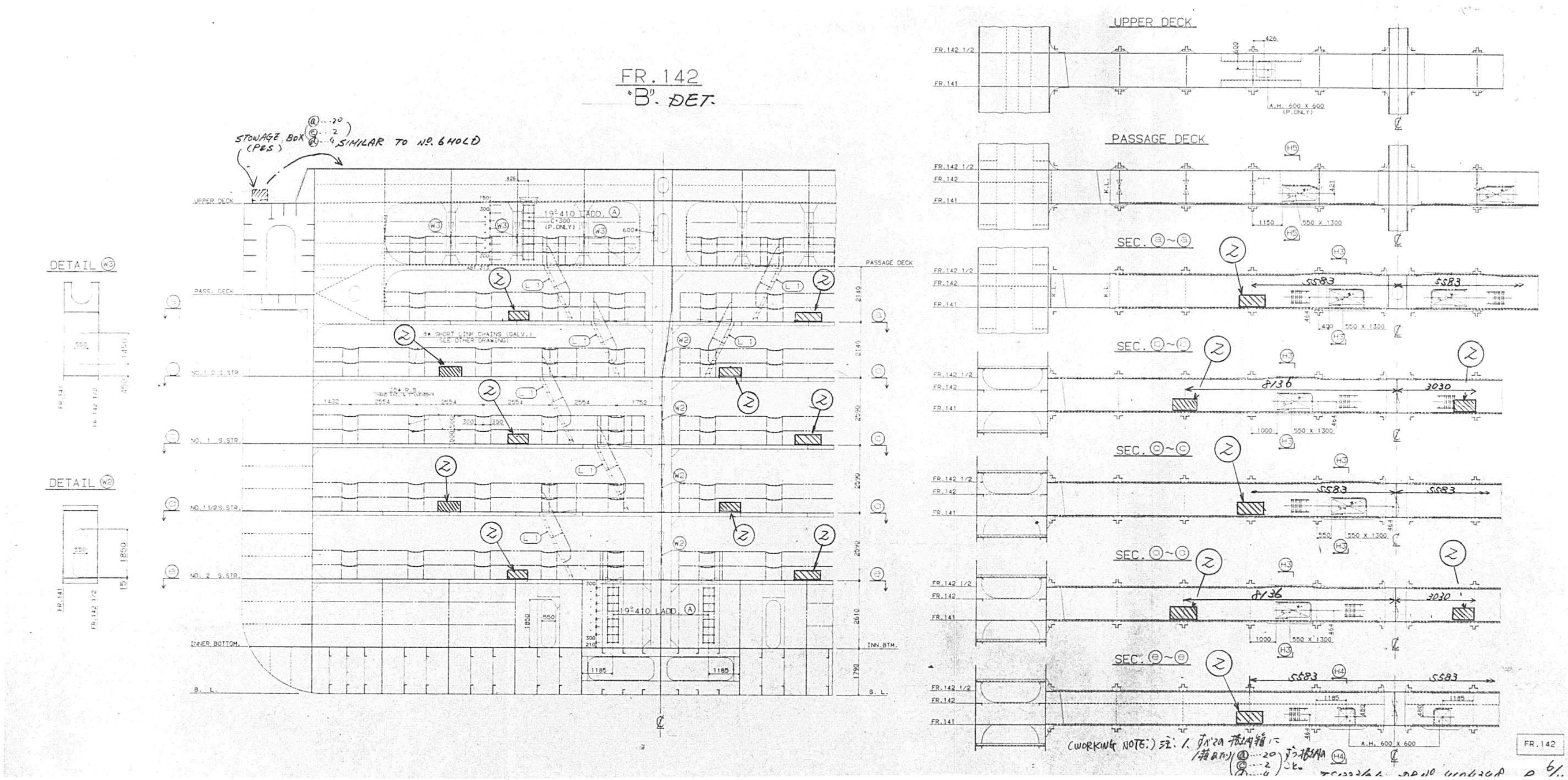


2/2

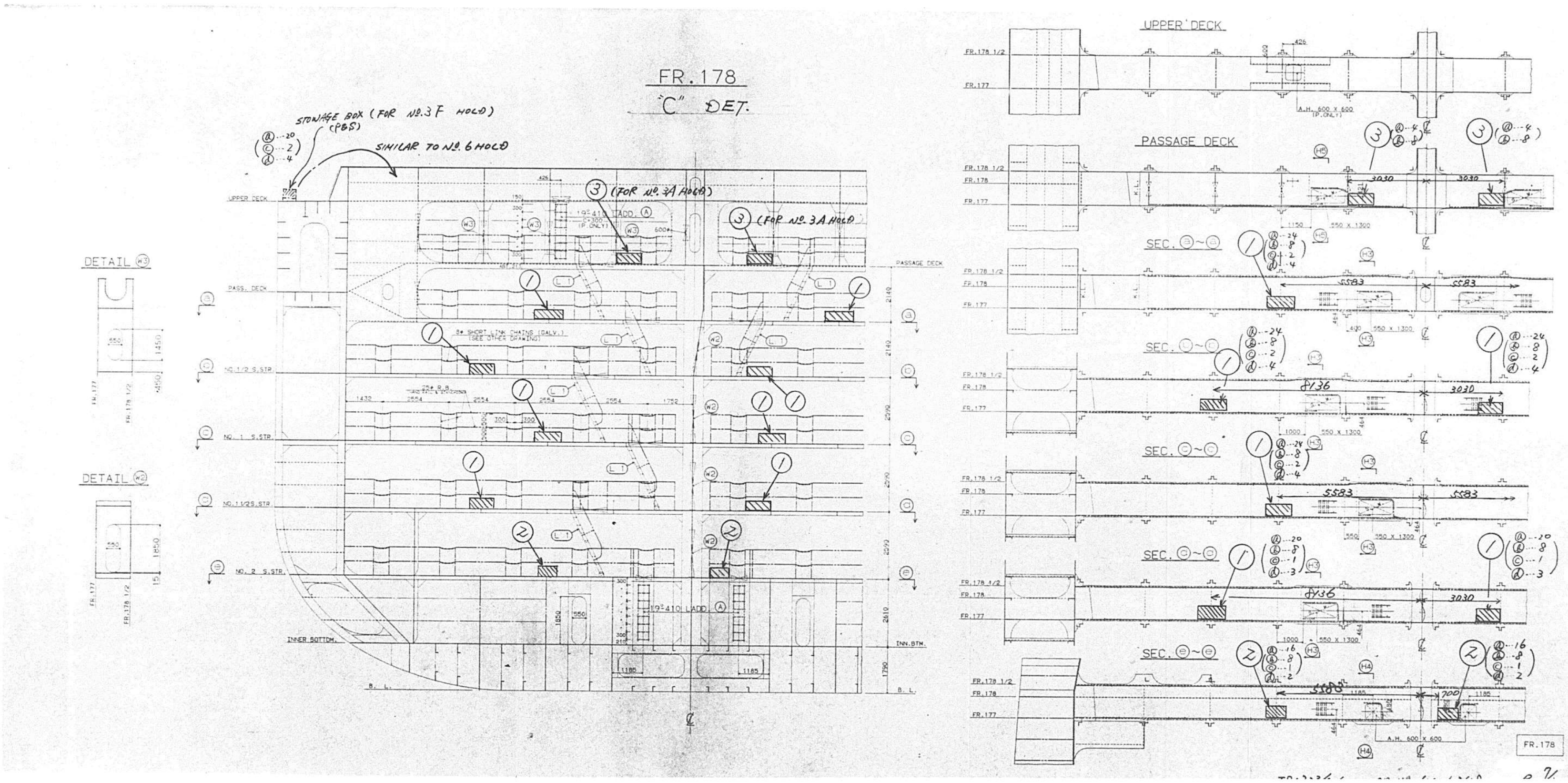
1088



1089

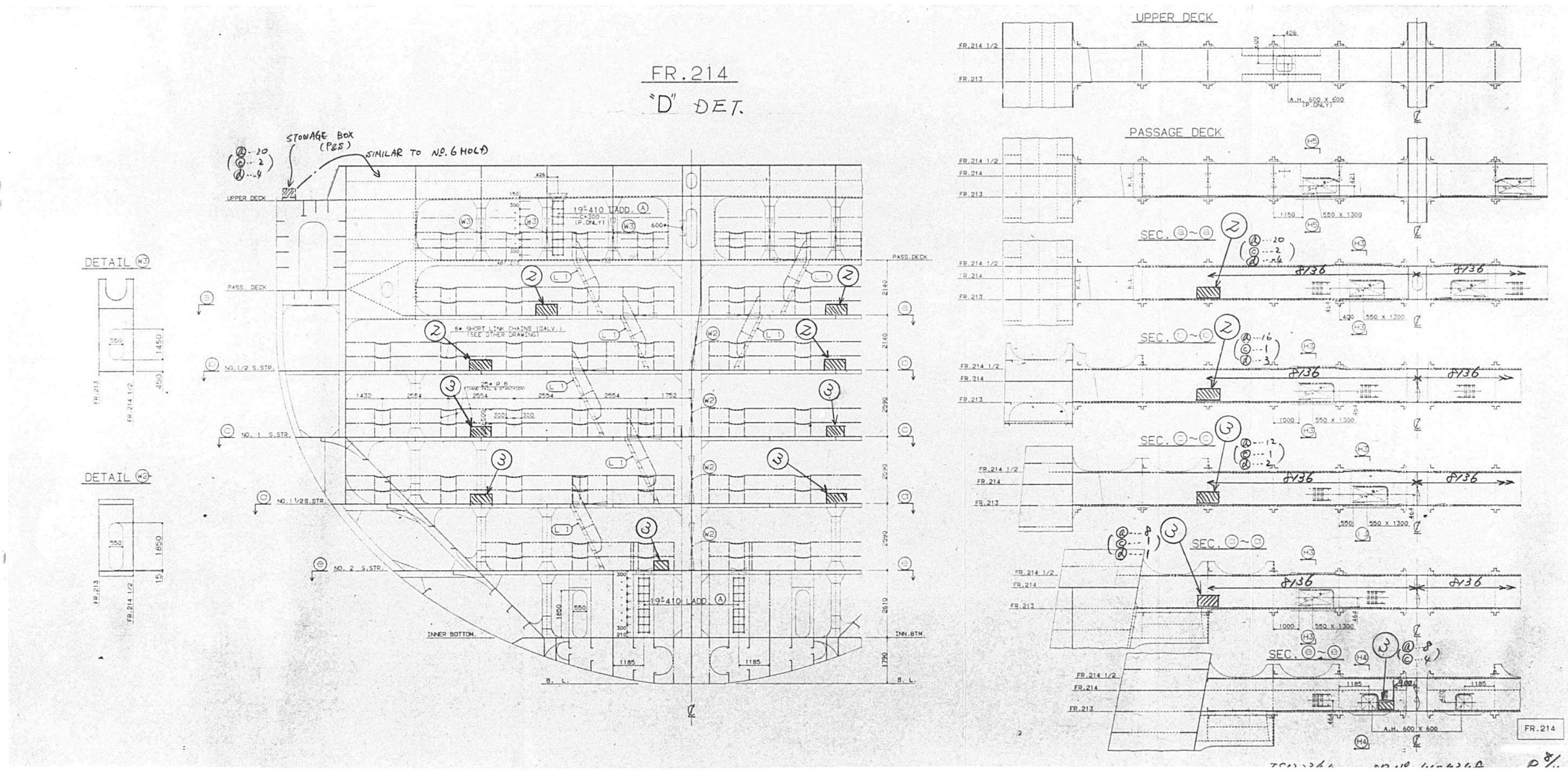

FR. 142
"B". DET.
STOWAGE BOX (PES)
SIMILAR TO No. 6 HOLD
DETAIL W3
DETAIL W2
UPPER DECK
PASS. DECK
PASSAGE DECK
NO. 1 S. STR.
NO. 2 S. STR.
INNER BOTTOM
INN. BTM.
B. L.
19-410 LADD.
PASSAGE DECK
SEC. Ⓑ~Ⓑ
SEC. Ⓒ~Ⓒ
SEC. Ⓓ~Ⓓ
SEC. Ⓔ~Ⓔ
SEC. Ⓕ~Ⓕ
5583
8136
3030
FR. 142 1/2
FR. 142
FR. 141
A.H. 600 X 600
550 X 1300
(WORKING NOTE.)

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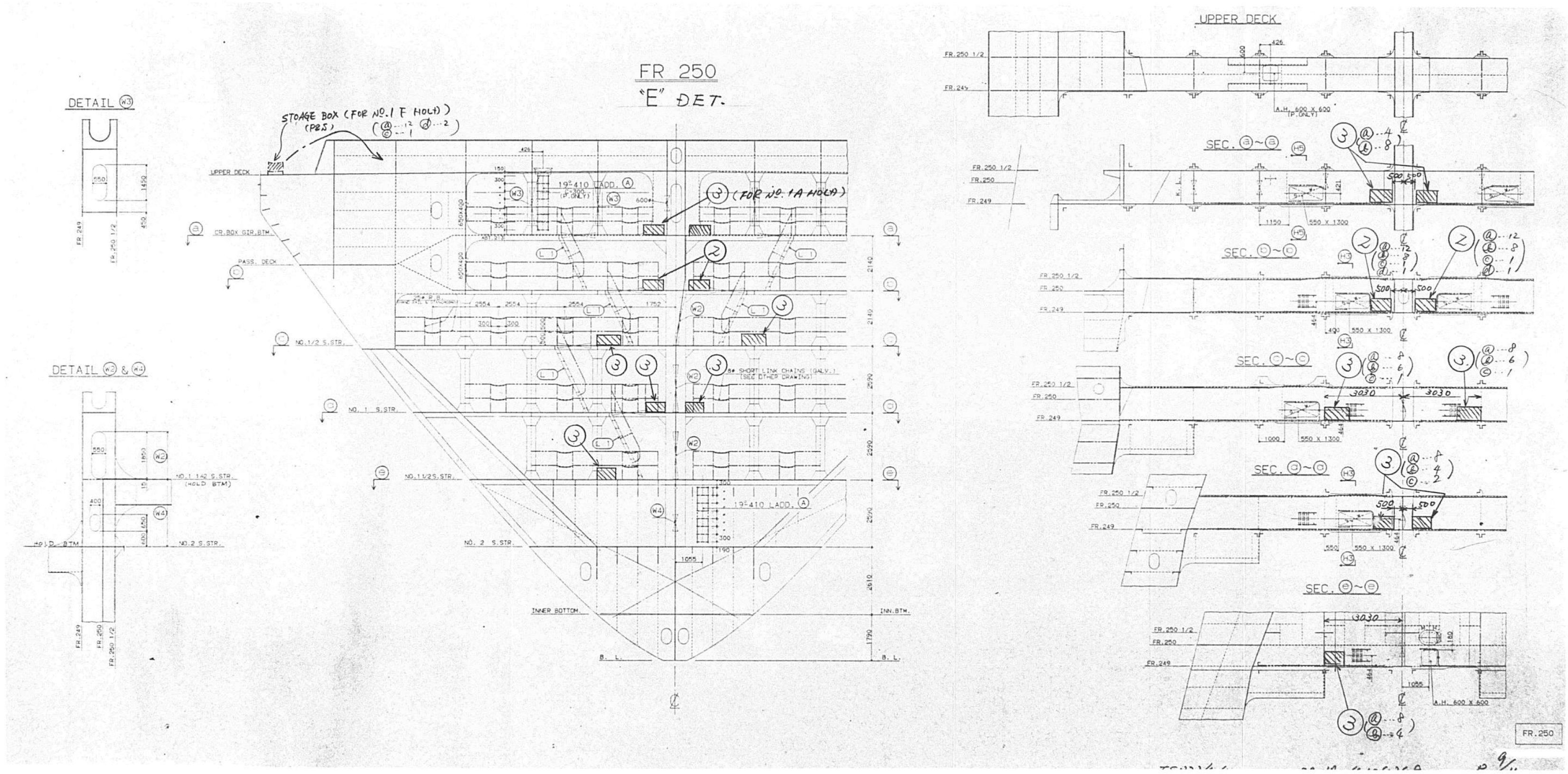
FR. 178
"C" DET.
STOWAGE BOX (FOR No. 3F HOLD) (PBS)
SIMILAR TO No. 6 HOLD
DETAIL W3
DETAIL W2
UPPER DECK
PASSAGE DECK
PASS. DECK
INNER BOTTOM
INN. BTM
B.L.
UPPER DECK
PASSAGE DECK
SEC.
FR.178

1091



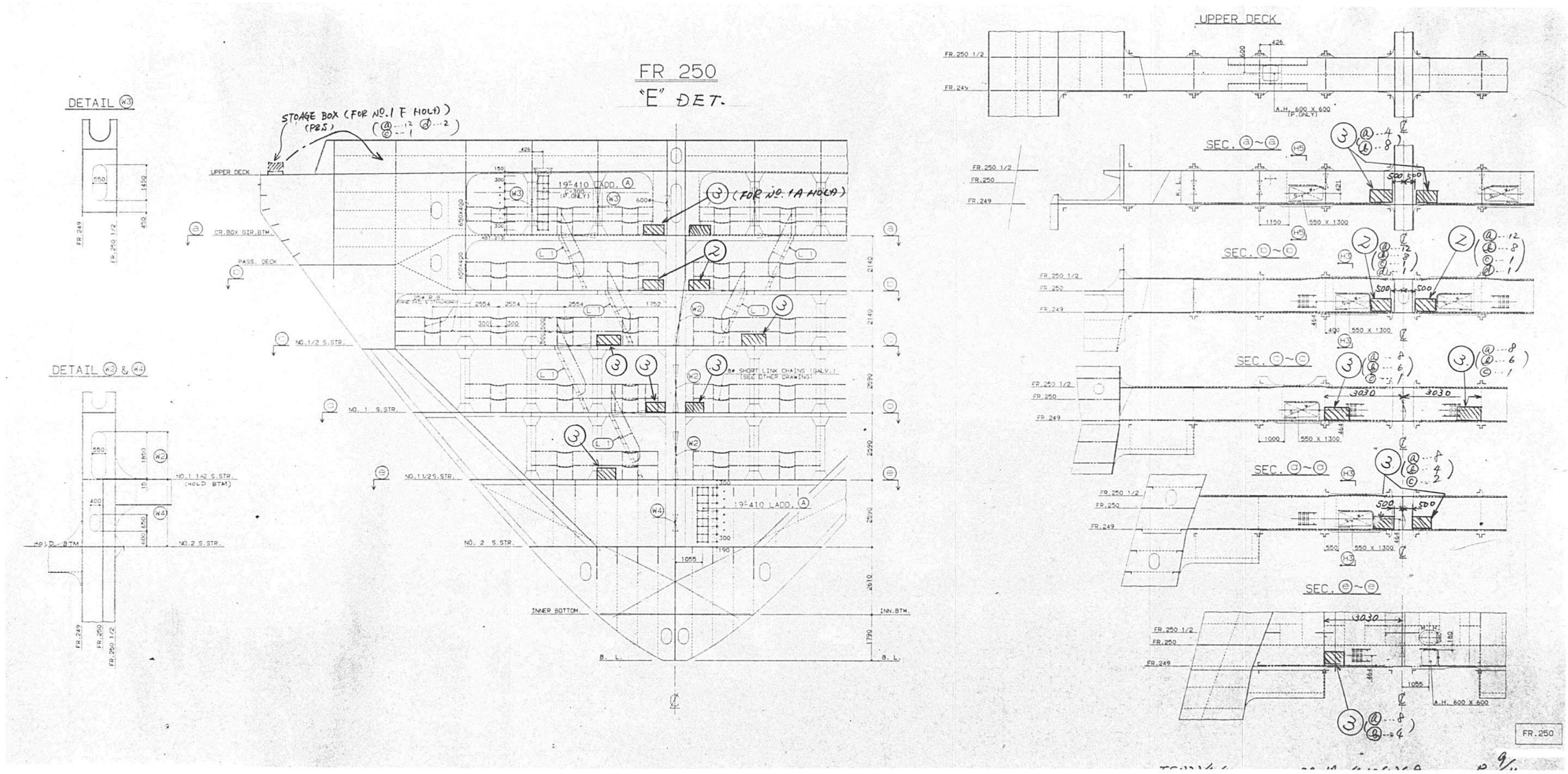
FR. 214
"D" DET.
STOWAGE BOX (P&S)
SIMILAR TO NO. 6 HOLD
DETAIL
DETAIL
UPPER DECK
PASS. DECK
NO. 1/2 S. STR.
NO. 1 S. STR.
NO. 1 1/2 S. STR.
NO. 2 S. STR.
INNER BOTTOM
INN. BTM.
B. L.
UPPER DECK
PASSAGE DECK
SEC.
A.H. 600 X 600
FR. 214 1/2
FR. 214
FR. 213

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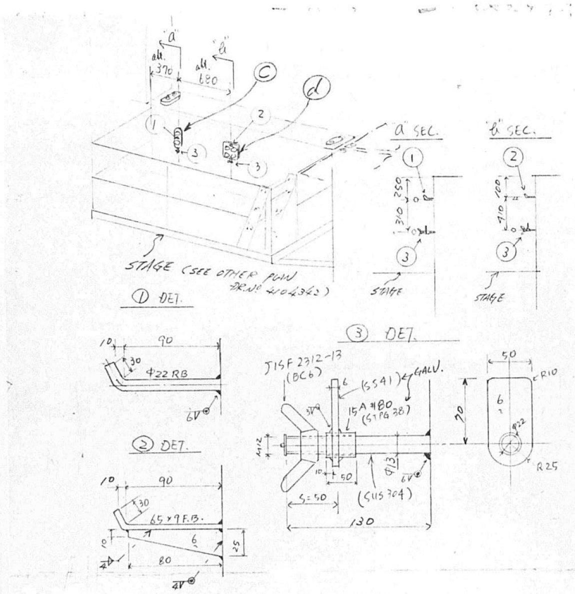
FR 250
"E" DET.
DETAIL W3
DETAIL W2 & W4
STORAGE BOX (FOR NO. 1 F HOLD)
UPPER DECK
PASS. DECK
NO. 1/2 S.STR.
NO. 1 S.STR.
NO. 2 S.STR.
INNER BOTTOM
B.L.
19-410 LADD.
(FOR NO. 1A HOLD)
UPPER DECK
SEC. Ⓐ~Ⓐ
SEC. Ⓒ~Ⓒ
SEC. Ⓓ~Ⓓ
SEC. Ⓔ~Ⓔ
SEC. Ⓔ~Ⓔ
550 X 1300
A.H. 600 X 600
FR. 250

1093



FR 250
"E" DET.
DETAIL W3
DETAIL W2 & W4
STORAGE BOX (FOR NO.1 F HOLD)
UPPER DECK
SEC. a~a
SEC. b~b
SEC. c~c
SEC. d~d
SEC. e~e
FR.250

1093



3	STOPPER	SUS304, STPG, BRASS, SS41				2	(III)(+)			GALV. (SS41 only)
2	HOOK	SS41				1	"			GALV.
1	HOOK	SS41				1	(III)(+)			GALV.
符号 NO.	名称 NAME	材料 MATERIAL	試験片 TEST PIECE	常備 USE	予備 SPARE	合計 TOTAL	関係工場 WORK SHOP	1個 ONE	合計 TOTAL	記事 REMARKS
				製造個数 QUANTITY				重量(kg) WEIGHT		

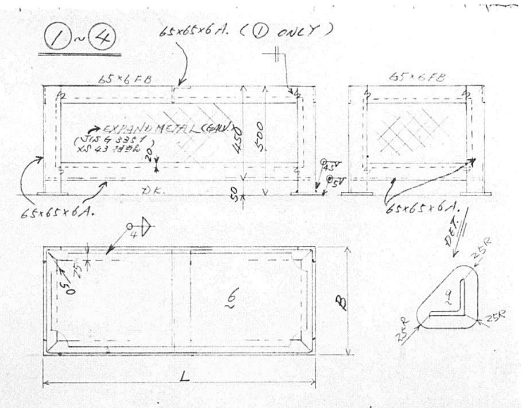
製造個数は 1SET 分を示す 1SET/（1隻分） 3 隻分製造のこと。

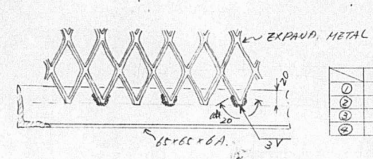
"F" PART
STOWAGE METHOD OF V. STACKER

尺度 SCALE /

61131-3袋-エ.A4.ト 200.48.1.TH

TSO. 1323/4 DR. NO. 4104348 PAGE 10/11





	L	B
①	1000	500
②	800	500
③	600	500
④	500	300

4	STOWAGE BOX	SS41 MILD STEEL				3	(III)(+)			
3	"	"				18	"			
2	"	"				22	"			
1	STOWAGE BOX	SS41 MILD STEEL				11	(III)(+)			
符号 NO.	名称 NAME	材料 MATERIAL	試験片 TEST PIECE	常備 USE	予備 SPARE	合計 TOTAL	関係工場 WORK SHOP	1個 ONE	合計 TOTAL	記事 REMARKS
				製造個数 QUANTITY				重量(kg) WEIGHT		

製造個数は 1隻 分を示す （1隻分） 3 隻分製造のこと。

STOWAGE BOX

尺度 SCALE /

61131-3袋-エ.A4.ト 200.48.1.TH

TSO. 1323/4 DR. NO. 4104348 PAGE 11/11

ALT. NO.	OWNER DATE	OWNER LETTER NO.	USCG DATE	USCG LETTER NO.	ABS DATE	ABS LETTER NO.	USPH DATE	USPH LETTER NO.
ORIGINAL	6 MAR '86	TELEX EF13/HES-1150						
⚠	8 MAY '86	TAM/164						

APPROVAL OF OWNER & REGULATORY BODIES

FINISHEDPLAN

SHIPYARD AND SHIP'S NO. & NAME			
MITSUI TAMANO		MITSUBISHI KOBE	
NO.1323	DOCTOR LYKES	NO.1158	JAMES LYKES
NO.1324	ALMERIA LYKES	NO.1159	JOSEPH LYKES
NO.1325	TILLIE LYKES	NO.1164	SOLON TURMAN

MITSUI ENGINEERING & SHIPBUILDING CO., LTD.
TAMANO WORKS

SHIP DESIGN DEPARTMENT MANAGER — SHIP'S NO. **NO.1325** — SHIP'S NAME **TILLIE LYKES**

OUTFITTING DESIGN SECTION
SEC. CHIEF / ASSISTANT CHIEF

APR. OF STOWAGE BOX & GUIDE STANCHION FOR LOOSE FITTING (ON DECK)

DATE (TEL 3232)

JOB NO.	SCALE	LYKES REF. NO.	MITSUI DRAWING NO.	REV
TS1323/24/25 JOBCLASSIF. NO. D24.23	/	270010	4104347	R

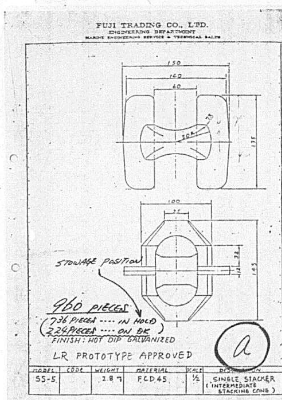
(24 SHEETS WITH COVER)

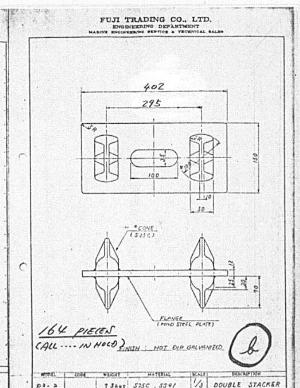
P. 1/24

PLAN RECORD

ALT. NO.	MARK	ALTERATION/DESCRIPTION	DATE & SIGNATURE
		PREPARED FOR S.NO. 1323 AS FINISHED PLAN, CHANGED AS FOLLOW	
		⚠ ------ ADDED THE R-1 TYPE GUIDE STANCHION OF LASHING ROD.	NOVEMBER 26, 86
		⚠ ------ ADDED THE R-2 TYPE GUIDE STANCHION OF LASHING ROD.	
		⚠ ------ ADDED THE R-3 TYPE GUIDE STANCHION OF LASHING ROD.	
		MADE APPLICABLE TO S.NO. 1324 AND S.NO. 1325.	

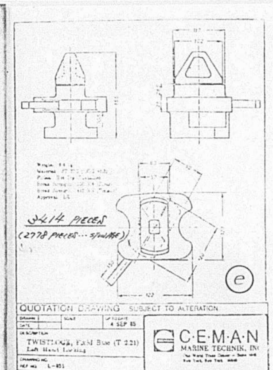
DWG. NO. 4104347

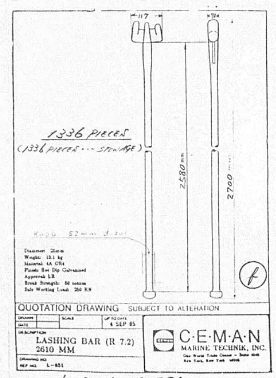




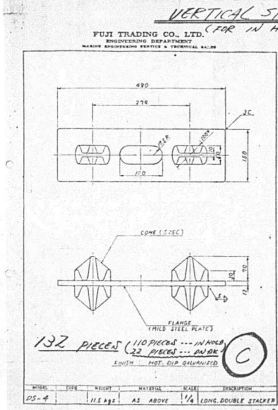
VERTICAL STACKER (COFE) (FOR IN HOLD)

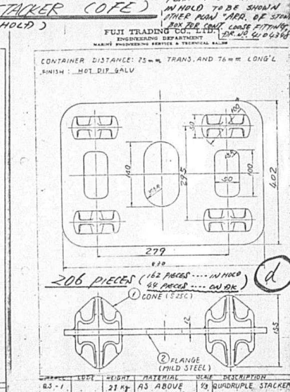
PLAN OF STOWAGE BOX IN HOLD TO BE SHOWN OTHER PLAN "APR. OF STOWAGE BOX FOR CONT. LOOSE FITTING" DR. NO. 4104348



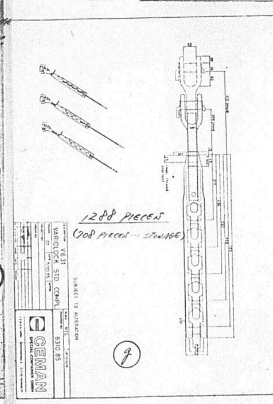


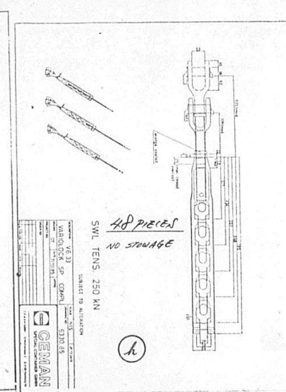
LOOSE FITTING OF ON DECK (COFE)





TS1323/6/4 DR. NO. 4104347 P. 3/24





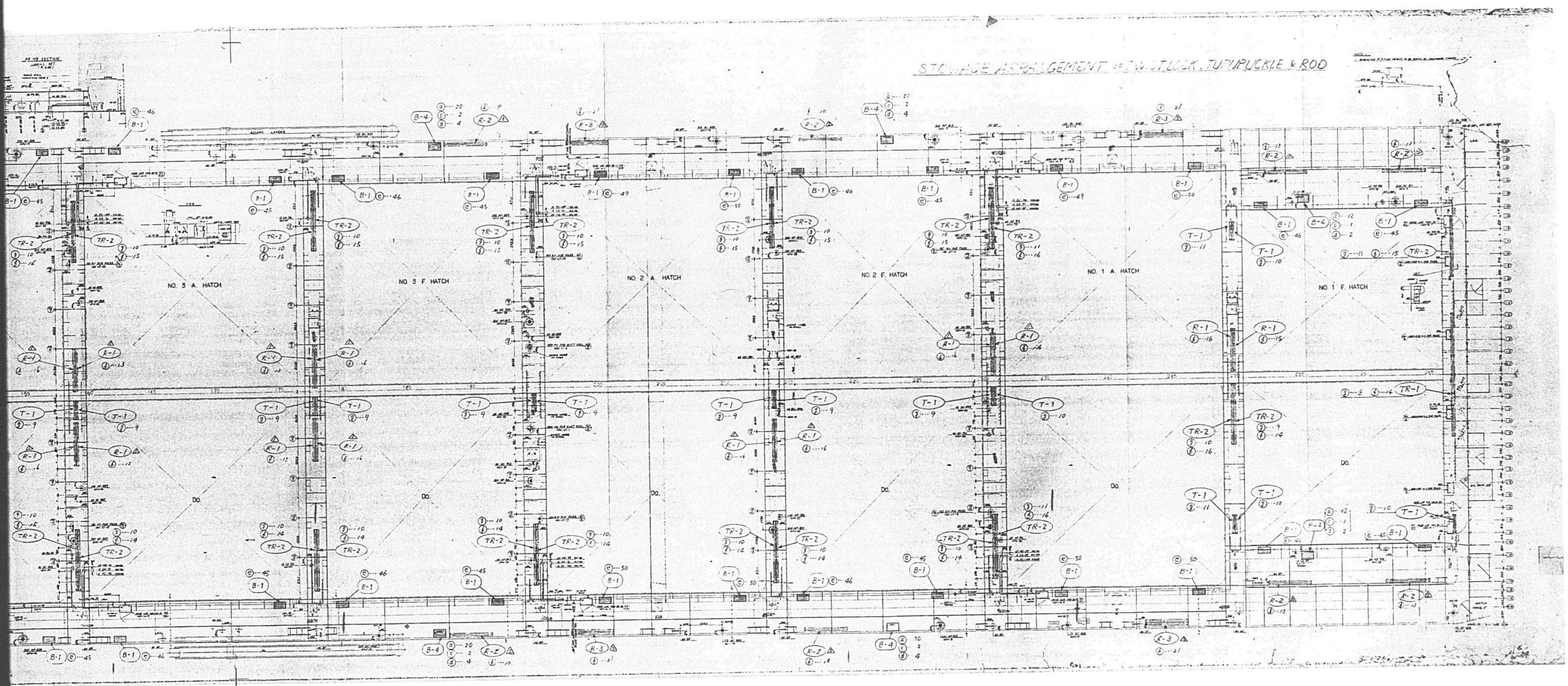
TS1323/6/5 DR. NO. 4104347 P. 4/24

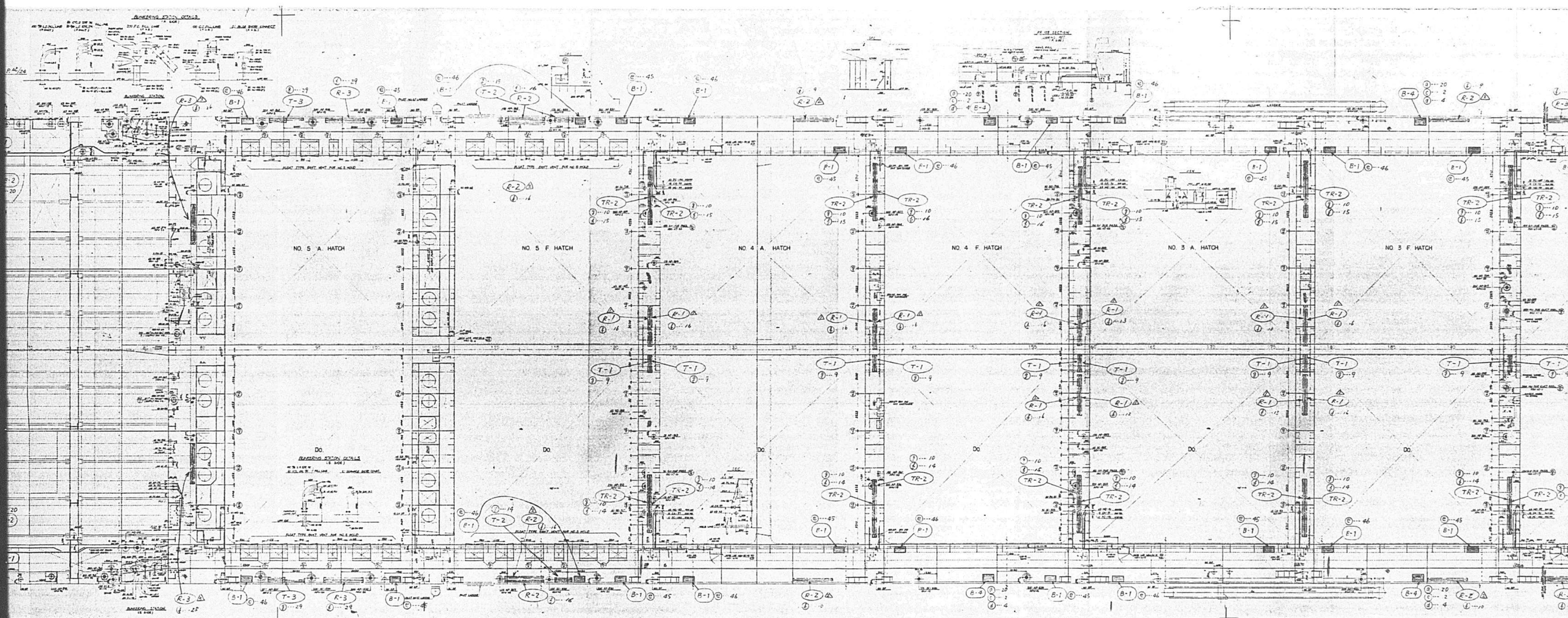
符号 NO.	名称 NAME	材料 MATERIAL	試験片 TEST PIECE	常備 USE	予備 SPARE	合計 TOTAL	関係工場 WORK SHOP	1個 ONE	合計 TOTAL	記事 REMARKS
VL-3	"	SS41 & SGP MILD STEEL & ST. PIPE				1	[illegible]			
VL-2	" SUS 304	SS41 & AAM MILD STEEL & CLADDED ST.				1	↑			
VL-1	VERTICAL LADDER	SS41 & AAM MILD STEEL & CLADDED ST.				4				(半数対称)
R-3	GUIDE STANCHION OF LASHING ROD	SS41 & AAM MILD STEEL & CLADDED ST.				10				
R-2	"	SS41 & AAM MILD STEEL & CLADDED ST.				16				
R-1	GUID STANCHION OF LASHING ROD	SS41 MILD STEEL				22				
TR-2	GUID STANCHION OF TURNBUCKLE & LASHING ROD	SS41 MILD STEEL				37				37個の5/16個は本図と対称に製作
TR-1		SS41 MILD STEEL				1				
T-3	GUIDE STANCHION OF TURNBUCKLE	SS41 & AAM MILD STEEL & CLADDED ST.				2				(半数対称)
T-2	"	SS41 & AAM MILD STEEL & CLADDED ST.				2				
T-1	GUIDE STANCHION OF TURNBUCKLE	SS41 MILD STEEL				25				
B-5	STOWAGE BOX	—				10				(半数対称)
B-4	PORTABLE STOWAGE BOX FOR HOLD	—				12				
B-3	STOWAGE BOX	—				4				
B-2	" "	—				4	↓			
B-1	STOWAGE BOX	—				48	[illegible]			

製造個数は 1 隻 分を示す　　2 隻分製造のこと。

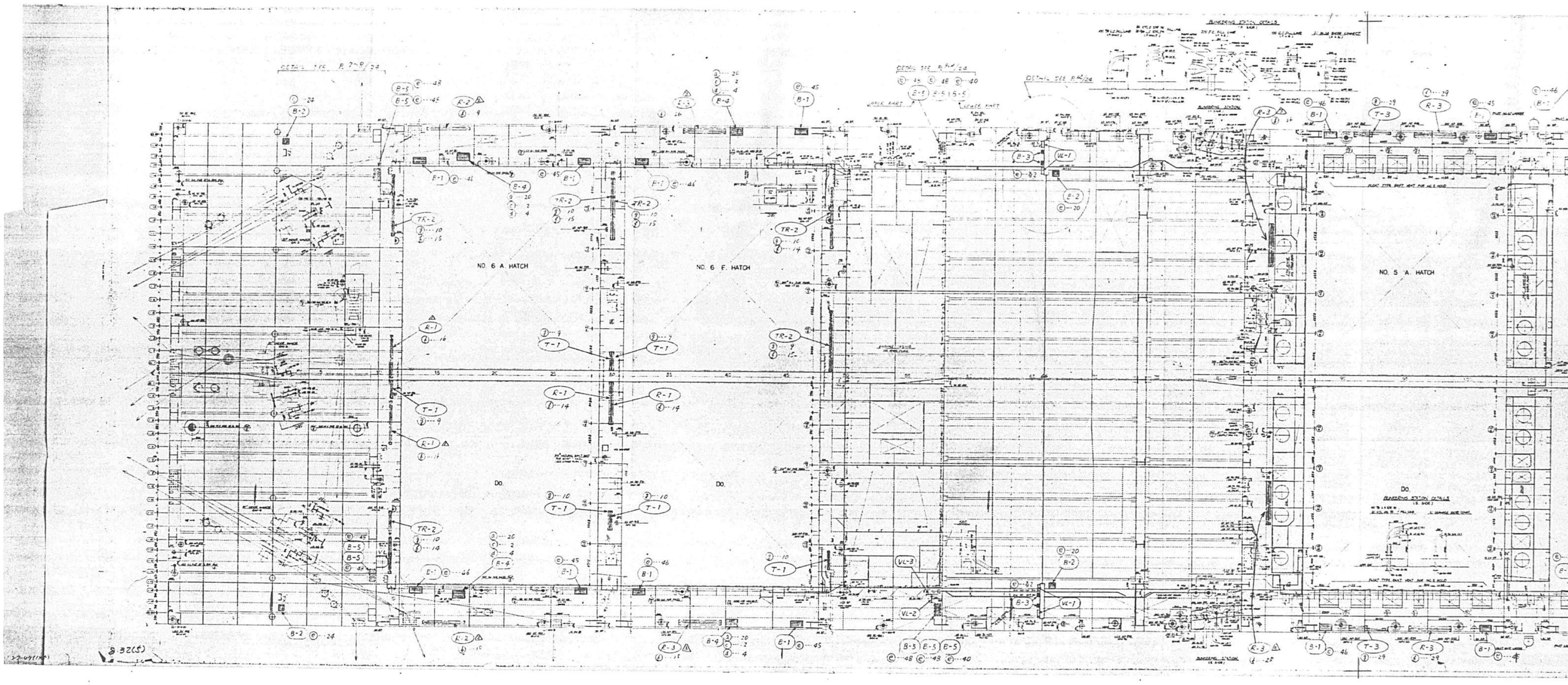
LIST　　尺度 SCALE

TSO. 1323/4/5　DR. NO. 4104347　PAGE 5/24

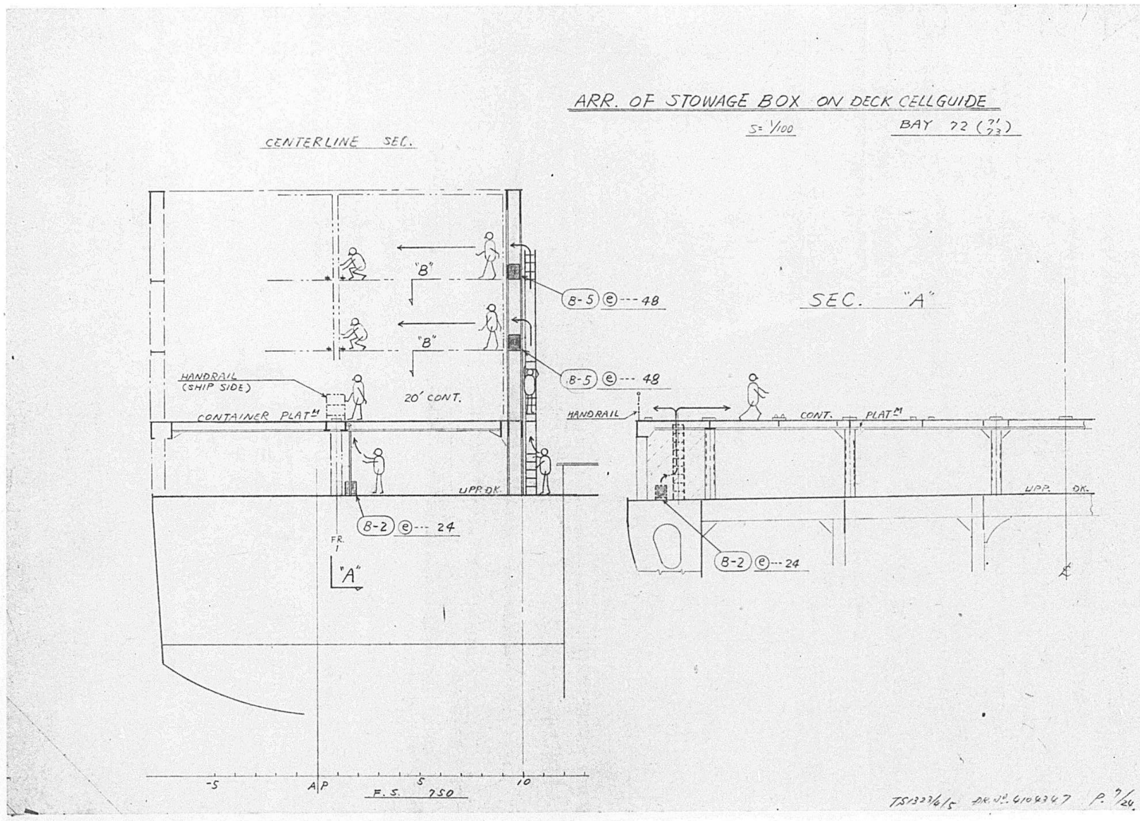

STOWAGE ARRANGEMENT OF TWISTLOCK, TURNBUCKLE & ROD
NO. 3 A. HATCH
NO. 3 F. HATCH
NO. 2 A. HATCH
NO. 2 F. HATCH
NO. 1 A. HATCH
NO. 1 F. HATCH

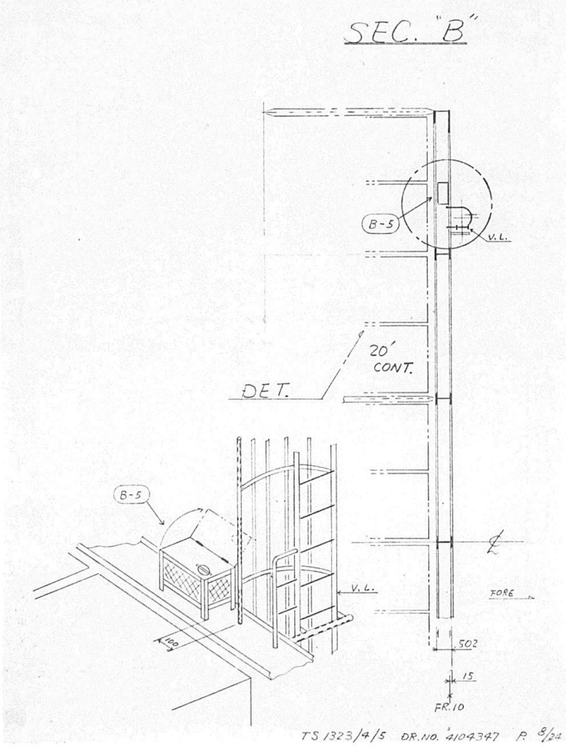

NO. 5 A. HATCH
NO. 5 F HATCH
NO. 4 A. HATCH
NO. 4 F HATCH
NO. 3 A. HATCH
NO. 3 F HATCH

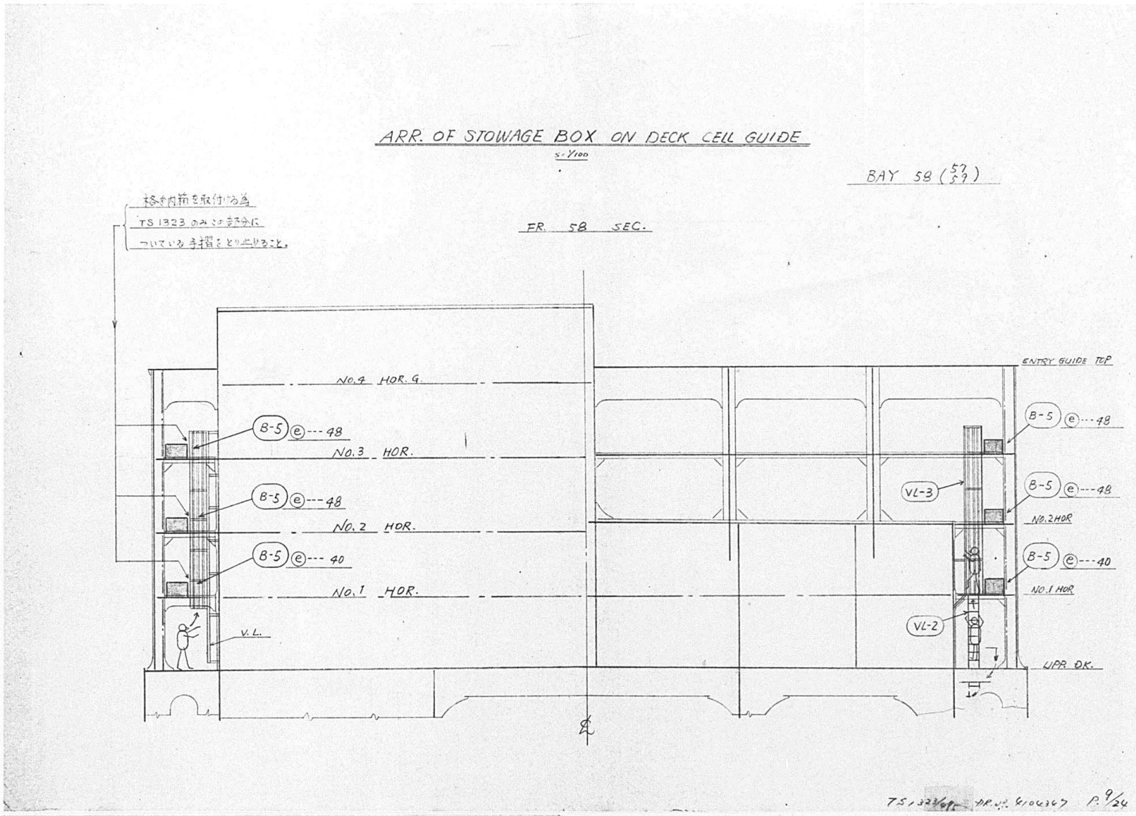
2/3 1098



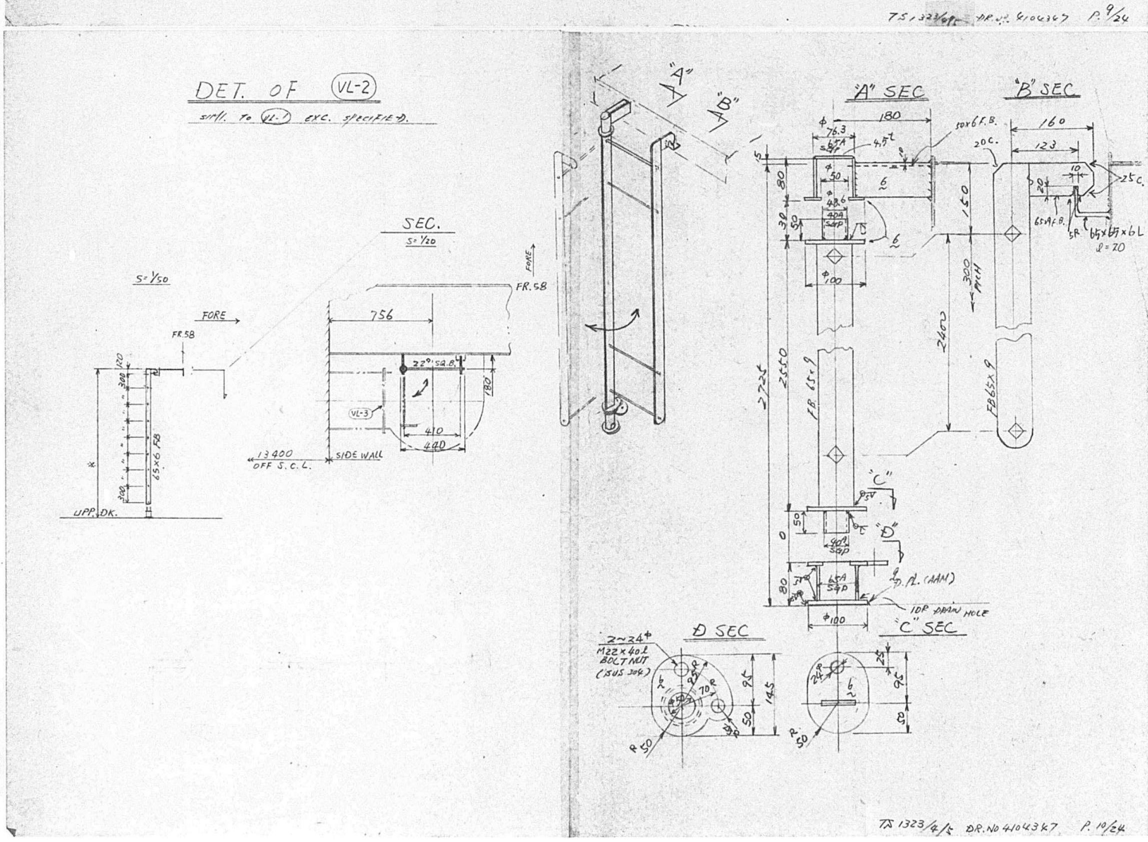
3/3 1099


ARR. OF STOWAGE BOX ON DECK CELLGUIDE
S=1/100
BAY 72 (71/73)
CENTERLINE SEC.
SEC. "A"
"B"
"B"
B-5 ⓔ --- 48
B-5 ⓔ --- 48
HANDRAIL (SHIP SIDE)
20' CONT.
CONTAINER PLAT^M
HANDRAIL
CONT.
PLAT^M
UPP. DK.
UPP. DK.
B-2 ⓔ --- 24
B-2 ⓔ --- 24
"A"
-5
AP
5
10
F.S. 750
TS1323/6/5 DR.No. 4104347 P. 7/24

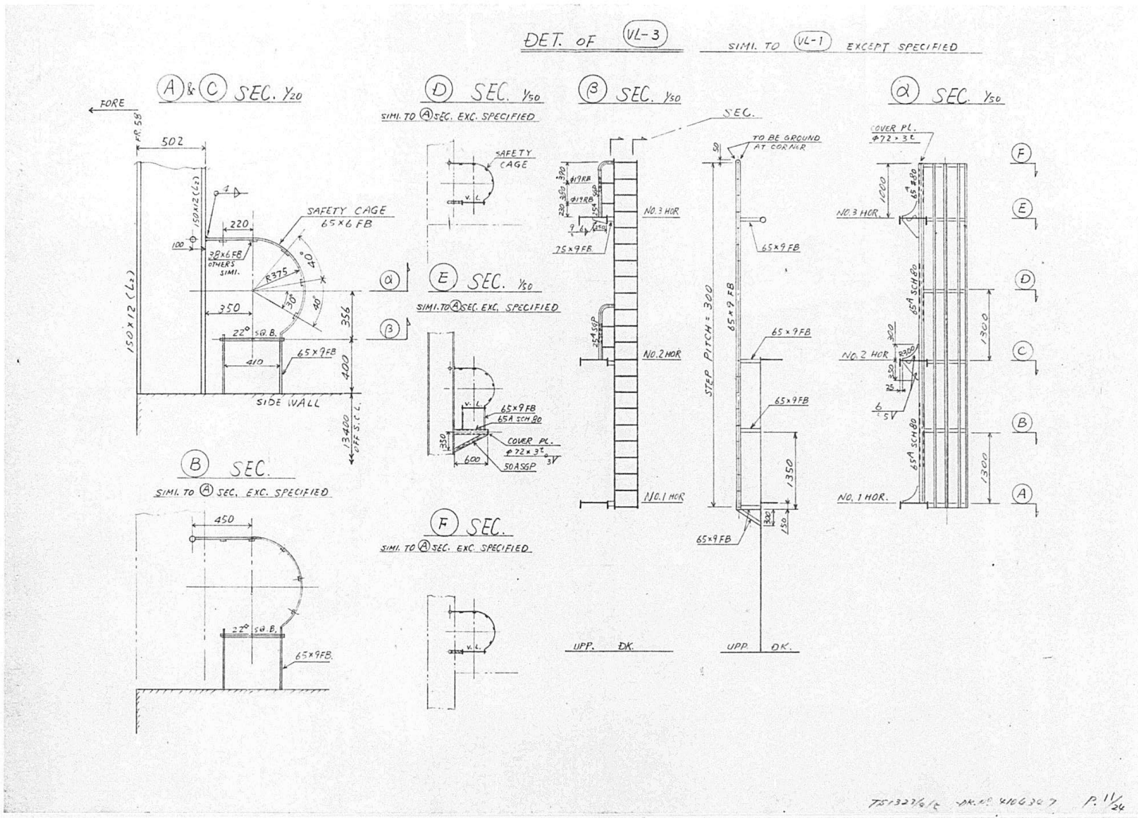

SEC. "B"
B-5
V.L.
20' CONT.
DET.
B-5
V.L.
FORE
502
15
FR.10
TS 1323/4/5 DR.NO. 4104347 P. 8/24

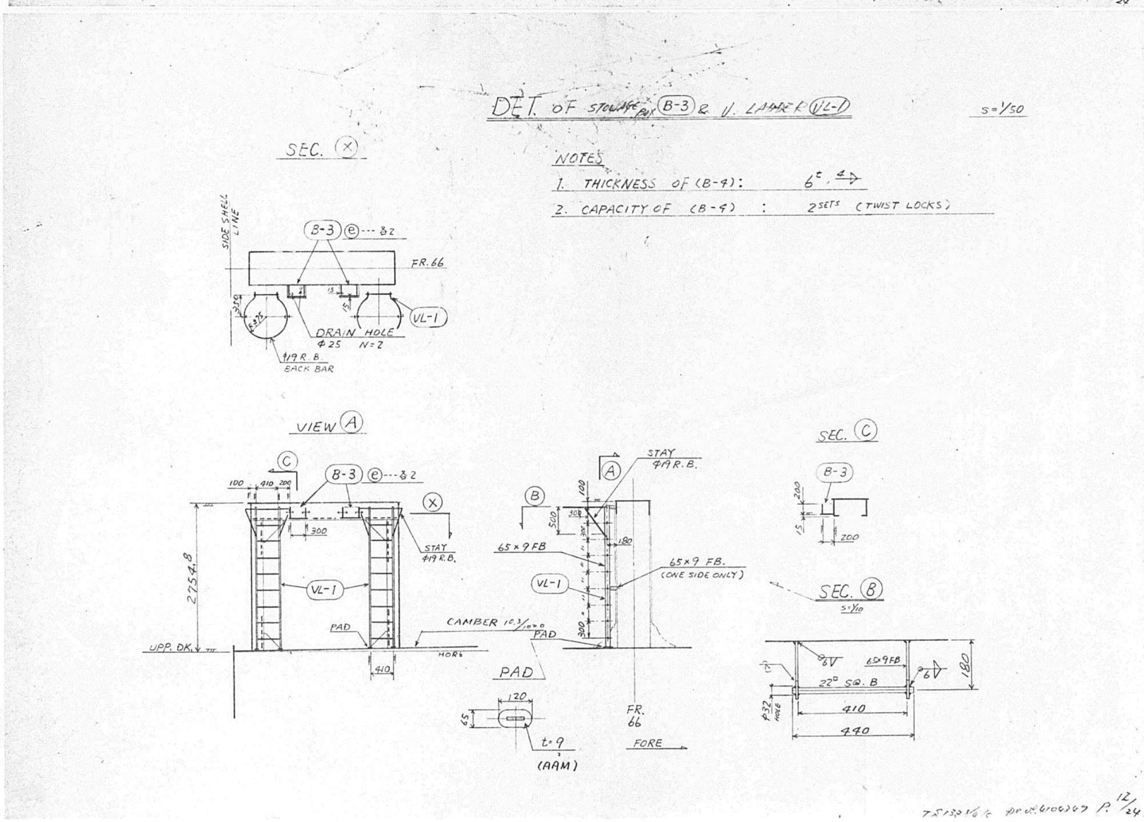


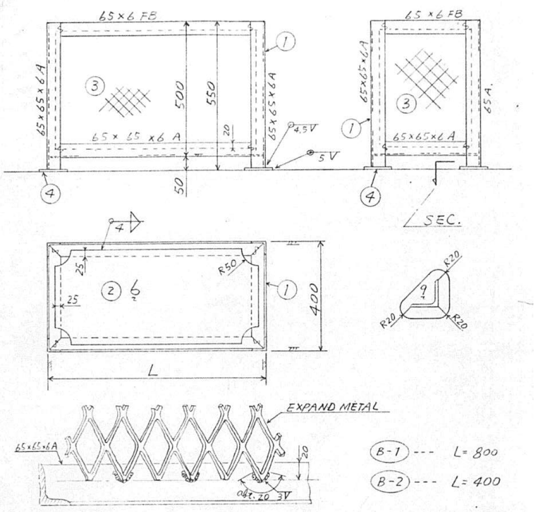
ARR. OF STOWAGE BOX ON DECK CELL GUIDE
S=1/100
BAY 58 (57/57)
FR. 58 SEC.
格納箱を取付ける為
TS 1323 のみこの部分に
ついている手摺をとり止めること。
NO.4 HOR. G
NO.3 HOR.
NO.2 HOR.
NO.1 HOR.
B-5 (e)---48
B-5 (e)---48
B-5 (e)--- 40
V.L.
ENTRY GUIDE TOP
VL-3
NO.2 HOR
NO.1 HOR
VL-2
UPPR. DK.
TS 1323 DR. NO. 4104347 P. 9/24



DET. OF (VL-2)
SIM. TO (VL-1) EXC. SPECIFIED.
SEC.
S=1/20
S=1/50
FORE
FR.58
756
410
440
VL-3
13400 OFF S.C.L.
SIDE WALL
65×6 FB
UPP. DK.
"A"
"B"
"A" SEC
"B" SEC
180
160
123
FB 65×9
FB65×9
2400
2550
2724
"C"
"D"
D SEC
"C" SEC
2-24φ
M22×40L BOLT NUT (SUS 304)
10φ DRAIN HOLE
φ100
145
TS 1323 DR. NO. 4104347 P. 10/24


DET. OF VL-3
SIMI. TO VL-1 EXCEPT SPECIFIED
A & C SEC. 1/20
D SEC. 1/50
SIMI. TO A SEC. EXC. SPECIFIED
B SEC. 1/50
α SEC. 1/50
E SEC. 1/50
SIMI. TO A SEC. EXC. SPECIFIED
B SEC.
SIMI. TO A SEC. EXC. SPECIFIED
F SEC.
SIMI. TO A SEC. EXC. SPECIFIED
FORE
SAFETY CAGE
65×6 FB
SIDE WALL
13400 OFF S.C.L.
STEP PITCH = 300
TO BE GROUND AT CORNER
COVER PL.
NO. 3 HOR.
NO. 2 HOR.
NO. 1 HOR.
UPP. DK.
TS1327/6/c DK.No. 4106307 P. 11/24


DET. OF STOWAGE B-3 & V. LADDER VL-1
S = 1/50
NOTES
1. THICKNESS OF (B-4): 6ᵗ
2. CAPACITY OF (B-4) : 2SETS (TWIST LOCKS)
SEC. X
SIDE SHELL LINE
FR. 66
DRAIN HOLE
φ25 N=2
BACK BAR
VIEW A
STAY
CAMBER
PAD
UPP. DK.
SEC. C
SEC. B
FORE
(AAM)
TS1327/6/c DK.No. 4106307 P. 12/24



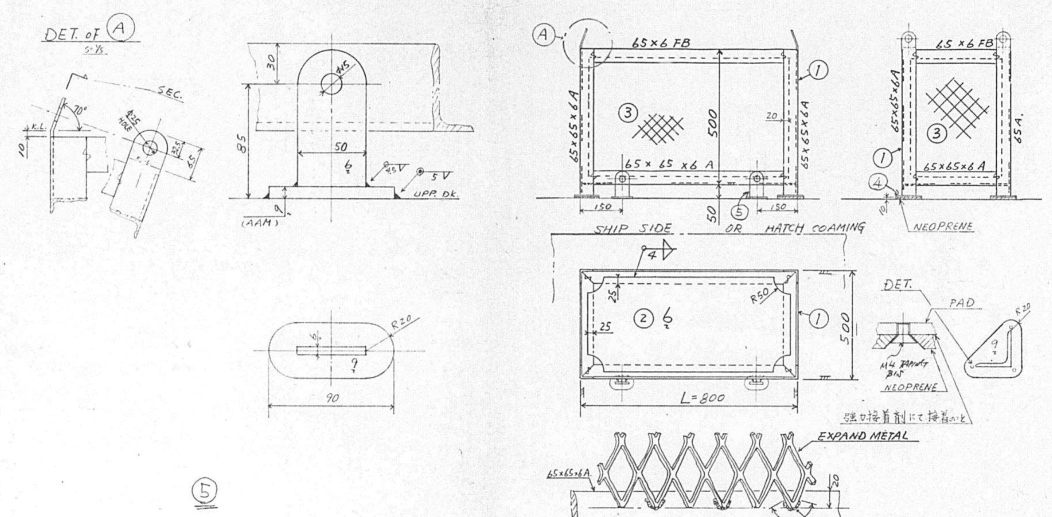
符号 NO.	名称 NAME	材料 MATERIAL	試験片 TEST PIECE	常備 USE	予備 SPARE	合計 TOTAL	関係工場 WORK SHOP	1個 ONE	合計 TOTAL	記事 REMARKS
4	PAD	船銘材 AAM				4				
3	EXPAND METAL	SS41 MILD STEEL				1 SET				JIS G3351 XS43 [illegible] (GALV.)
2	BOTTOM PL.	"				1				
1	FRAME	SS41 MILD STEEL				1				

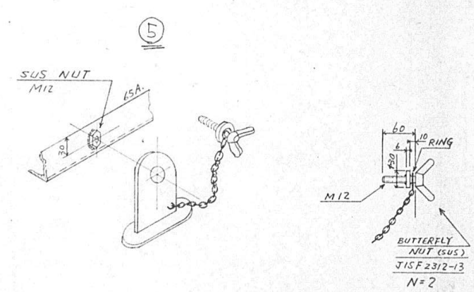
製造個数は 1組 分を示す

B-1 B-2 STOWAGE BOX (ツイトロック収納箱)

尺度 SCALE 1/10

TSO. 1323/6/5 DR. NO. 410347 PAGE 3/24





符号 NO.	名称 NAME	材料 MATERIAL	試験片 TEST PIECE	常備 USE	予備 SPARE	合計 TOTAL	関係工場 WORK SHOP	1個 ONE	合計 TOTAL	記事 REMARKS
5	STOPPER	SUS304 & SS41 AAM				2				
4	NEOPRENE PAD	NEOPRENE & SS41				4				
3	EXPAND METAL	SS41 MILD STEEL				1 SET				JIS G3351 XS63 [illegible] (GALV.)
2	BOTTOM PL.	"				1				
1	FRAME	SS41 MILD STEEL				1				

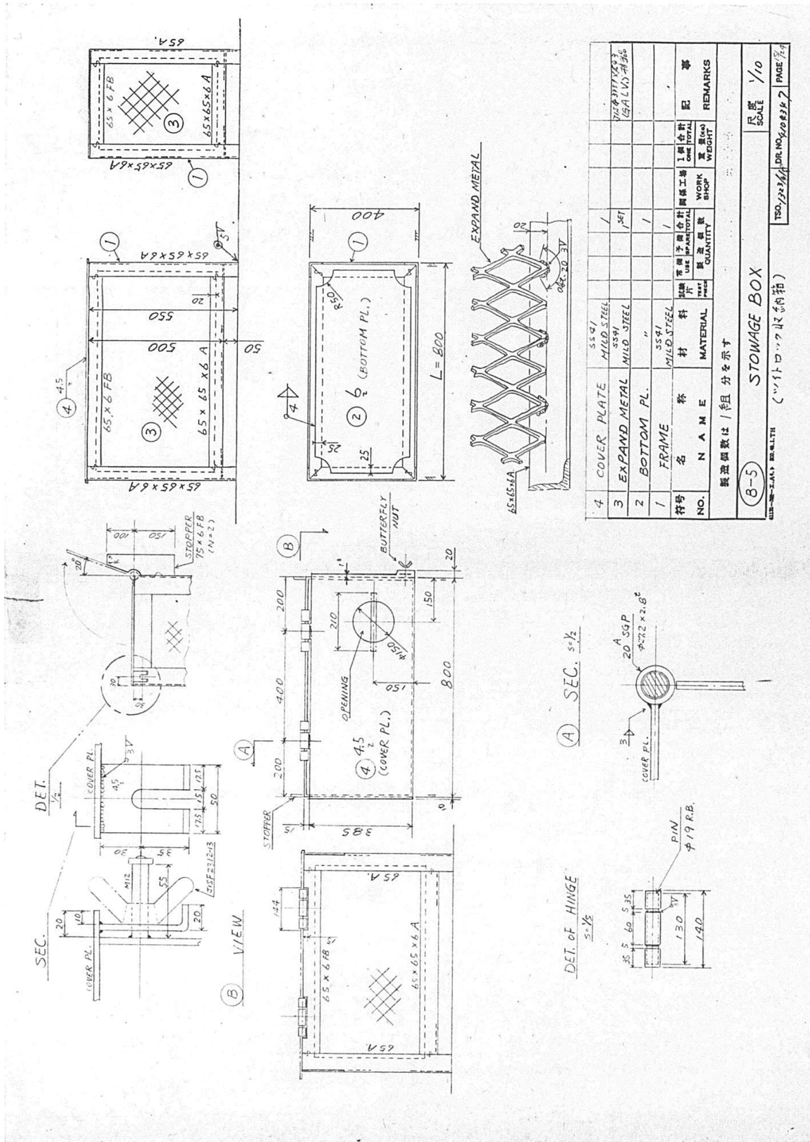
製造個数は 1組 分を示す

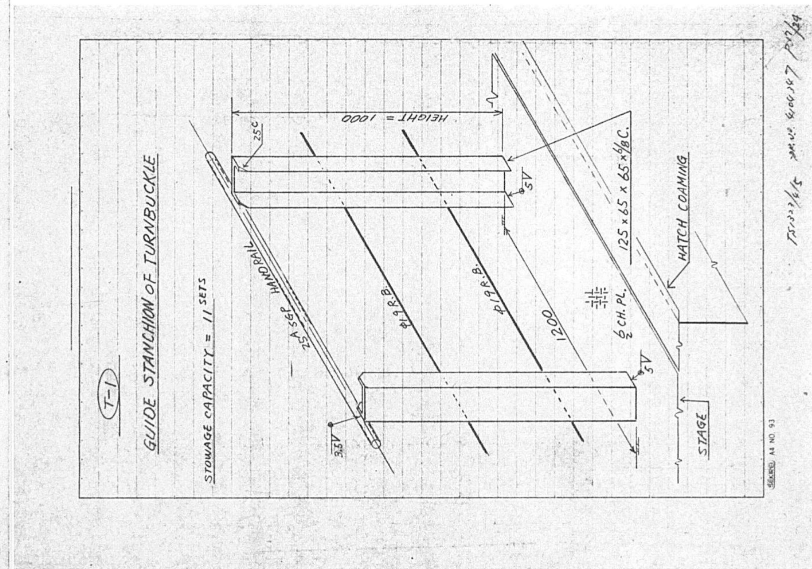
8-4 PORTABLE STOWAGE BOX FOR HOLD (ツイトロック収納箱)

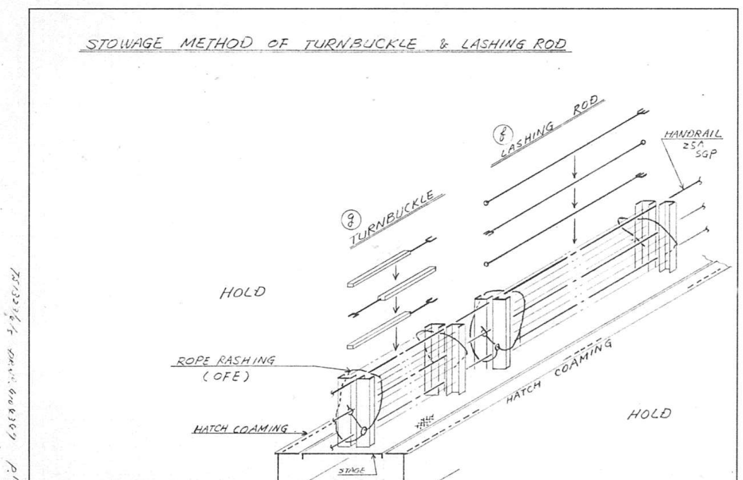
尺度 SCALE 1/10

TSO. 1323/6/5 DR. NO. 410347 PAGE 14/24

1103

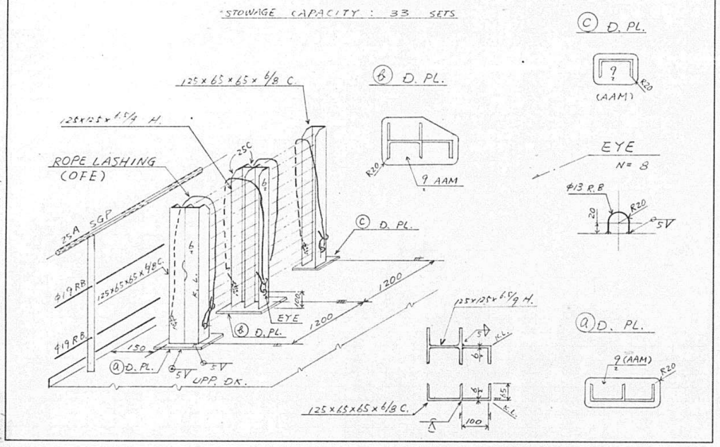

STOWAGE BOX
EXPAND METAL
COVER PLATE
BOTTOM PL.
FRAME
MILD STEEL
DET. OF HINGE
B VIEW
BUTTERFLY NUT
STOPPER
OPENING


T-1
GUIDE STANCHION OF TURNBUCKLE
STOWAGE CAPACITY = 11 SETS
HEIGHT = 1000
HANDRAIL
HATCH COAMING
STAGE


STOWAGE METHOD OF TURNBUCKLE & LASHING ROD
LASHING ROD
TURNBUCKLE
HANDRAIL 25A SGP
HOLD
ROPE RASHING (OFE)
HATCH COAMING
HATCH COAMING
HOLD
STAGE

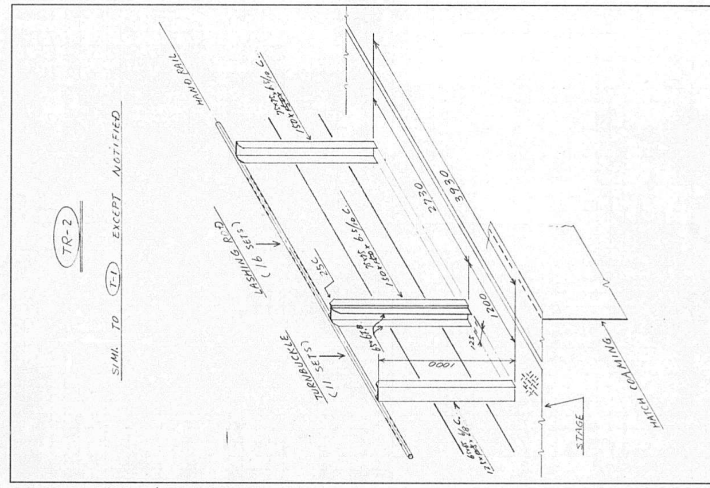
T-3 GUIDE STANCHION OF TURNBUCKLE

STOWAGE CAPACITY : 33 SETS



TS 1323/4/5 DR.NO. 4104347 P.19/24

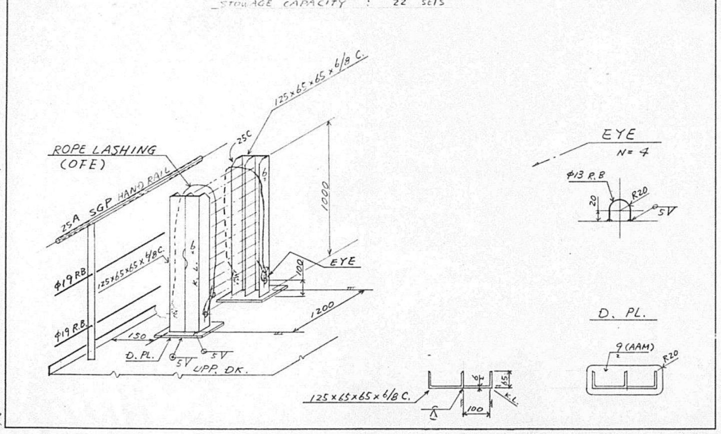
TR-2 SIMI. TO T-1 EXCEPT NOTIFIED



TS 1323/4/5 DR.NO. 4104347 P.21/24

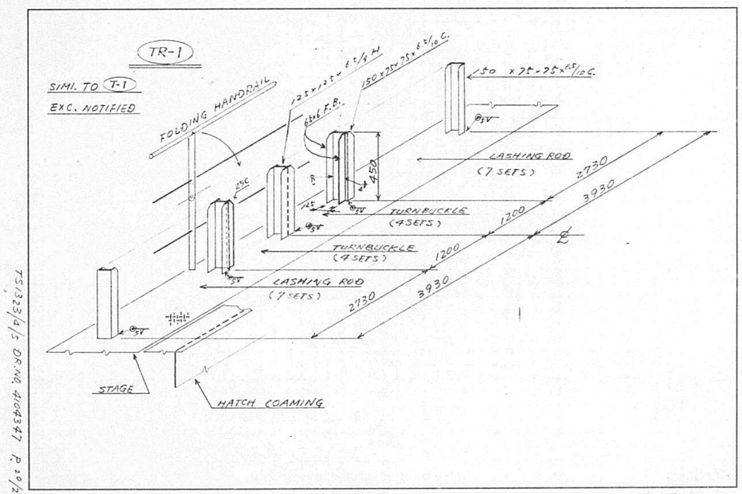
T-2 GUIDE STANCHION OF TURNBUCKLE

STOWAGE CAPACITY : 22 SETS



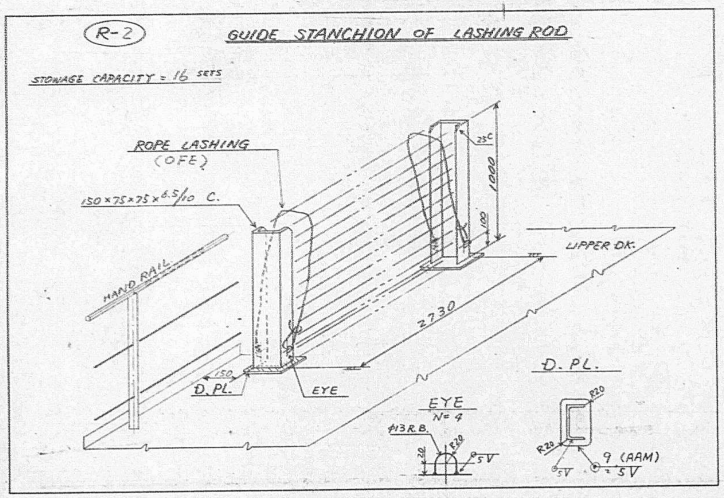
TS 1323/4/5 DR.NO. 4104347 P.18/24

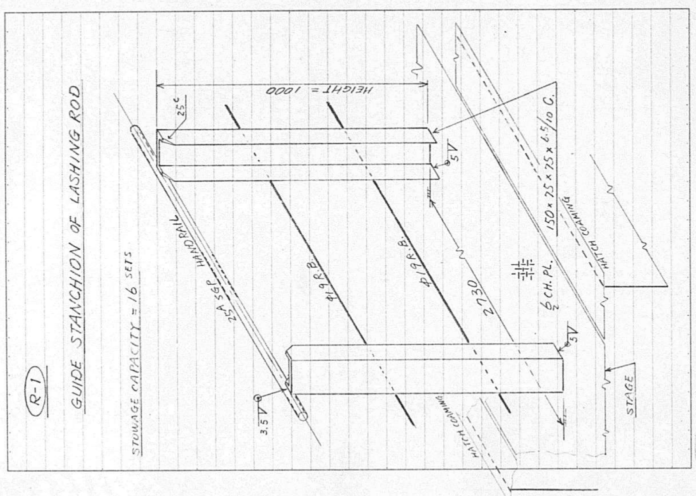
TR-1 SIMI. TO T-1 EXC. NOTIFIED

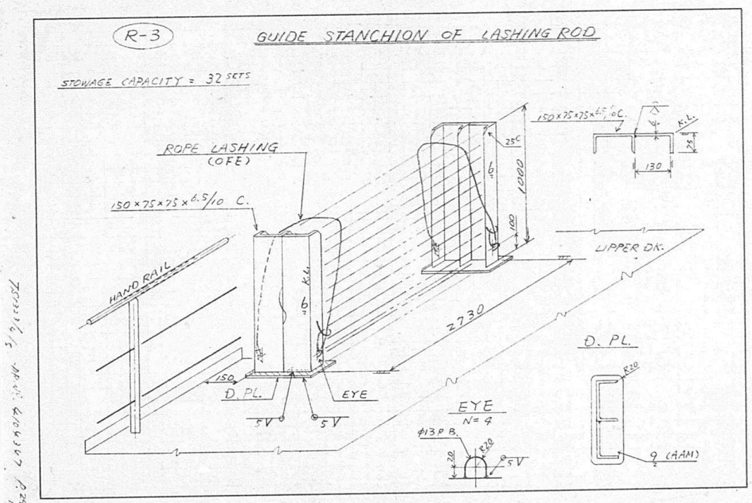


TS 1323/4/5 DR.NO. 4104347 P.20/24

1105


R-2
GUIDE STANCHION OF LASHING ROD
STOWAGE CAPACITY = 16 SETS
ROPE LASHING
(OFE)
150×75×75×6.5/10 C.
HAND RAIL
UPPER DK.
2730
1000
D. PL.
EYE
N=4
9 (AAM)
5V


R-1
GUIDE STANCHION OF LASHING ROD
STOWAGE CAPACITY = 16 SETS
HEIGHT = 1000
HANDRAIL
2730
150×75×75×6.5/10 C.
HATCH COAMING
STAGE
3.5V
5V


R-3
GUIDE STANCHION OF LASHING ROD
STOWAGE CAPACITY = 32 SETS
ROPE LASHING
(OFE)
150×75×75×6.5/10 C.
HAND RAIL
UPPER DK.
2730
1000
D. PL.
EYE
N=4
9 (AAM)
5V

1106

APPROVAL OF OWNER & REGULATORY BODIES

ALT. NO.	OWNER DATE	OWNER LETTER NO.	USCG DATE	USCG LETTER NO.	ABS DATE	ABS LETTER NO.	USPH DATE	USPH LETTER NO.
ORIGINAL	16 Oct '86	TAP/WDMcC						

SHIPYARD AND SHIP'S NO. & NAME			
MITSUI TAMANO		MITSUBISHI KOBE	
NO.1323	DOCTOR LYKES	NO.1158	JAMES LYKES
NO.1324	ALMERIA LYKES	NO.1159	JOSEPH LYKES
NO.1325	TILLIE LYKES	NO.1164	SOLON TURMAN

MITSUI ENGINEERING & SHIPBUILDING CO., LTD.
TAMANO WORKS

FINISHED PLAN

SHIP DESIGN DEPARTMENT MANAGER
SHIP'S NO. 1325
SHIP'S NAME TILLIE LYKES

CO-ORDINATION SECTION
SEC. CHIEF
ASSIST. CHIEF
CHARGE ENG'R
STAFF K. Azuma
DATE (TEL)

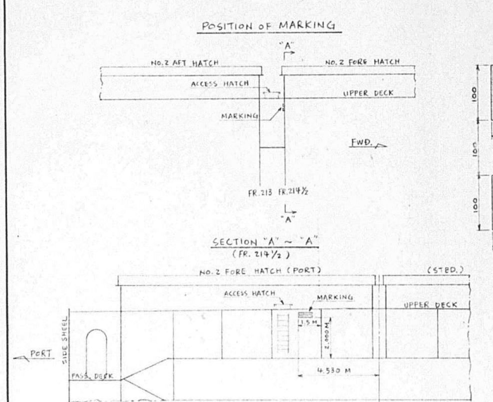
MARKING FOR NET TONNAGE AND OFFICIAL NUMBER

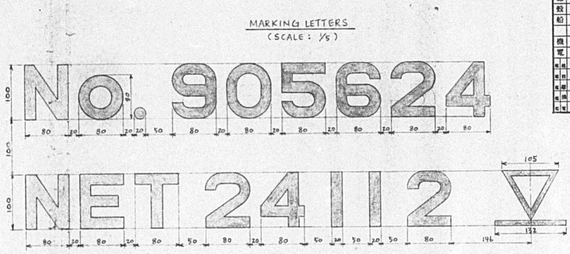
JOB NO. TS1323/24/25
JOB CLASSIF. NO.
SCALE
LYKES REF. NO. 280101
MITSUI DRAWING NO. 1102167

(3 SHEETS WITH COVER)

PLAN RECORD

ALT. NO.	MARK	ALTERATION/DESCRIPTION	DATE & SIGNATURE
		PREPARED FOR S. NO. 1325 AS FINISHED PLAN.	NOV. 10, 1986 K.A. [illegible]





NOTES: 1. THE LETTERS TO BE MARKED ON THE POSITION SHOWN ABOVE.
2. THE OUTLINE OF LETTERS SHALL BE CUTTED AND PAINTED WHITE.

記：1. 文字の標示位置および字形は上図による。
2. 文字は輪郭をタガネでハッキリと白色ペイントで塗ること。

MITSUI ENGINEERING & SHIPBUILDING CO., LTD.
TAMANO WORKS

SHIP DESIGN DEPARTMENT
CO-ORDINATION SECTION
SEC. CHIEF
ASSIST. CHIEF
CHARGE ENG'R
STAFF K. Azuma
DATE (TEL. 2222)

SHIP'S NO. 1325
SHIP'S NAME TILLIE LYKES

MARKING FOR NET TONNAGE AND OFFICIAL NUMBER
船舶番号および純トン数標示要領

JOB NO. TS1325
JOB CLASSF. NO.
SCALE
DRAWING NO. 1102167

HISTORY

1107

APPROVAL OF OWNER & REGULATORY BODIES

ALT. NO.	OWNER DATE	OWNER LETTER NO.	USCG DATE	USCG LETTER NO.	ABS DATE	ABS LETTER NO.	USPH DATE	USPH LETTER NO.
ORIGINAL	22ND FEB. 1985	OFTS/MES/114						

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SHIPYARD AND SHIP'S NO. & NAME			
MITSUI TAMANO		MITSUBISHI KOBE	
NO.1323	DOCTOR LYKES	NO.1158	JAMES LYKES
NO.1324	ALMERIA LYKES	NO.1159	JOSEPH LYKES
NO.1325	TILLIE LYKES	NO.1164	SOLON TURMAN

MITSUI ENGINEERING & SHIPBUILDING CO., LTD.
TAMANO WORKS

FINISHED PLAN

SHIP DESIGN DEPARTMENT MANAGER

SHIP'S NO. **1325** SHIP'S NAME **TILLIE LYKES**

CO-ORDINATION SECTION
SEC. CHIEF
ASSIST. CHIEF
CHARGED ENGR.
STAFF K. Azuma
DATE (TEL 2220)

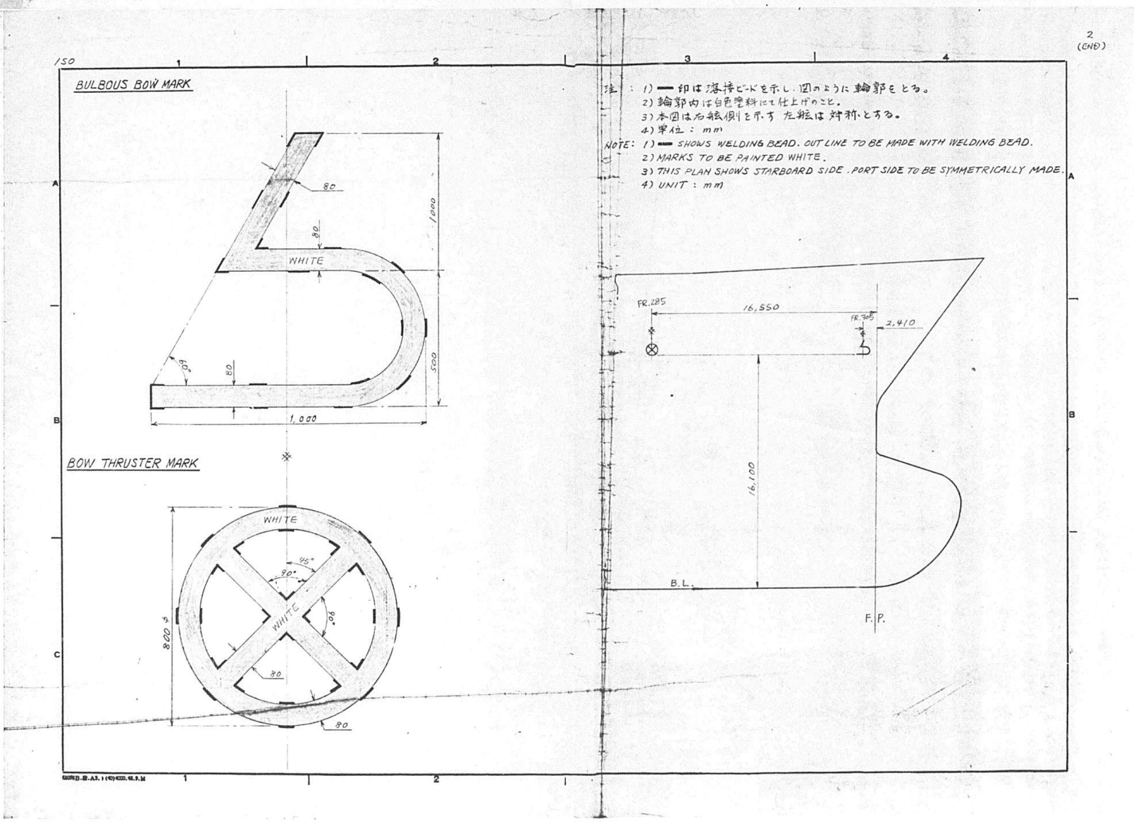
BULBOUS BOW AND BOW THRUSTER MARK

JOB NO. TS1323/24/25
JOBCLASSIF. NO.
SCALE
LYKES REF. NO. 280301
MITSUI DRAWING NO. 1102179

(3 SHEETS WITH COVER)

PLAN RECORD

ALT. NO.	MARK	ALTERATION/DESCRIPTION	DATE & SIGNATURE
		PREPARED FOR S. NO. 1323 AS FINISHED PLAN, MADE	NOV. 10, 1986
		APPLICABLE TO S. NO. 1324 AND S. NO. 1325.	K.A. MA



1108

APPROVAL OF OWNER & REGULATORY BODIES								
ALT. NO.	OWNER		USCG		ABS		USPH	
	DATE	LETTER NO.	DATE	LETTER NO.	DATE	LETTER NO.	DATE	LETTER NO.
ORIGINAL	26 JUN '86	OFTS/MES-77X-						
1ST PART REV	27 JAN '86	TAH/14						

FINISHEDPLAN

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SHIPYARD AND SHIP'S NO. & NAME			
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NO.1323	DOCTOR LYKES	NO.1158	JAMES LYKES
NO.1324	ALMERIA LYKES	NO.1159	JOSEPH LYKES
NO.1325	TILLIE LYKES	NO.1164	SOLON TURMAN

MITSUI ENGINEERING & SHIPBUILDING CO., LTD.
TAMANO WORKS

SHIP DESIGN DEPARTMENT MANAGER — STRUCTURE DESIGN SEC. — SEC. CHIEF — ASSIST. CHIEF — CHECKED — STAFF — DATE (TEL 2230)

SHIP'S NO. 1325 — SHIP'S NAME TILLIE LYKES

Ⓐ タンク標示マーク
Ⓑ タグボートプッシュマーク
Ⓐ TANK BOUNDARY MARKS
Ⓑ TUG PUSH MARKS

JOB NO. TS1323/24/25 — JOBCLASSIF. NO. — SCALE 1/50 — LYKES REF. NO. 280302 — MITSUI DRAWING NO. 2142085

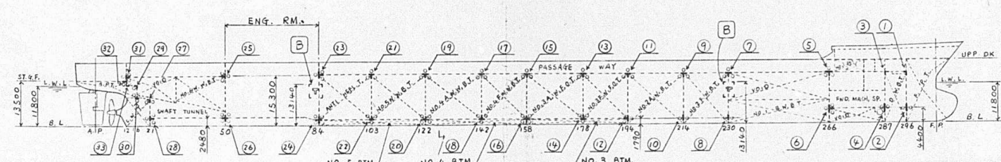
(7 SHEETS WITH COVER)

PLAN RECORD			
ALT. NO.	MARK	ALTERATION/DESCRIPTION	DATE & SIGNATURE
		"PREPARED FOR S.NO. 1323 AS FINISHED PLAN, MADE APPLICABLE TO S.NO. 1324 AND S.NO. 1325."	NOV. 28. '86

DWG. NO. 2142085 - 1/

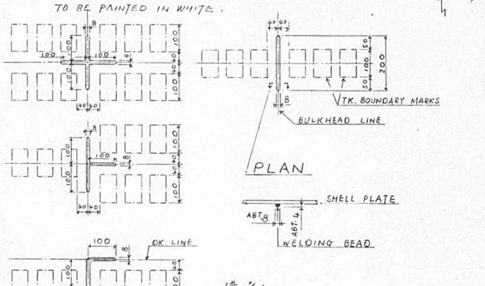
ARRANGEMENT OF BOUNDARY MARKS & TUG PUSH MARKS

(S. SIDE)



ARRANGEMENT OF MARKS

1) ABBREVIATION OF TANKS OR OTHER SPACE NAMES TO BE AS SHOWN ON THE RIGHT TABLE.
2) LETER TO BE SHIFTED ADEQUATELY IN CASE OF LAPPING TO WELD BEADS. (SEEMS & BUTTS)
3) WELDING BEAD OF TK BOUNDARY MARK & BHD. LINE TO BE PAINTED IN WHITE.



備考:—
1) 右舷は左から表へ、左舷は表から左へ向かって記入の事。
2) 外板シーム等にあたる文字は適当にずらして記入の事。

Ⓐ TANK BOUNDARY MARKS

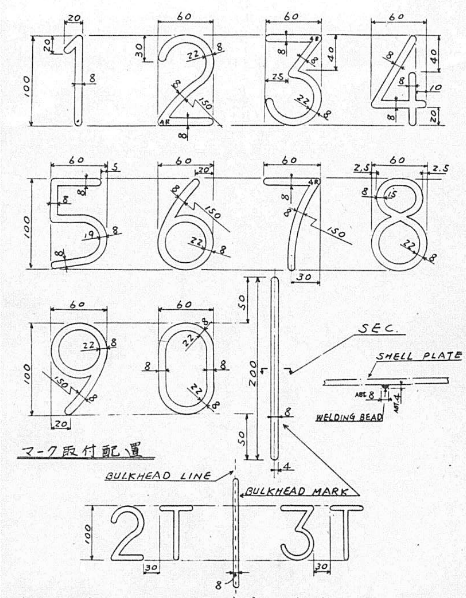
MARK	LETTER S. SIDE (AFT ← → FORE)	LETTER P. SIDE (FORE ← → AFT)	MARK	LETTER S. SIDE (AFT ← → FORE)	LETTER P. SIDE (FORE ← → AFT)
1	DWBT ┐ FPT	FPT ┌ DWBT	19	PASS / 5WBT ┬ 4AWBT	PASS / 4AWBT ┬ 5WBT
2	DWBT │ FPT	FPT │ DWBT	20	5WBT / 5BWBT ┼ 4AWBT / 4BWBT	4AWBT / 4BWBT ┼ 5WBT
3	┌ DWBT	DWBT ┐	21	PASS / HEEL T ┬ 5WBT	PASS / 5WBT ┬ HEEL T
4	FM SP │ DWBT	DWBT │ FM SP	22	HEEL T ┴ 5WBT / 5BWBT	5WBT ┴ HEEL T / 5BWBT
5	PASS / VOID ┬ A/C RM	PASS / A/C RM ┬ VOID	23	E RM ├ PASS / HEEL T	PASS / HEEL T ┤ E RM
6	1WBT ├ FM SP / VOID	FM SP / VOID ┤ 1WBT	24	E RM / VOID ┼ HEEL T / 5BWBT	HEEL T / 5BWBT ┼ E RM / VOID
7	PASS / 2FWBT ┬ VOID	PASS / VOID ┬ 2FWBT	25	PASS / 6WBT ┤ E RM	E RM ├ PASS / 6WBT
8	2FWBT │ 1WBT	1WBT │ 2FWBT	26	SHT / BLT ┼ E RM / BW	E RM / BW ┼ SHT / BLT
9	PASS / 2AWBT ┬ 2FWBT	PASS / 2FWBT ┬ 2AWBT	27	CWT ┐ SHT	SHT ┌ CWT
10	2AWBT │ 2FWBT	2FWBT │ 2AWBT	28	CWT ├ SHT / BW	SHT / BW ┤ CWT
11	PASS / 3F FOT ┬ 2AWBT	PASS / 2AWBT ┬ 3F FOT	29	APT ┐ VOID	VOID ┌ APT
12	3F FOT / 3B WBT ┤ 2AWBT	2AWBT ├ 3F FOT / 3B WBT	30	APT ┴ SHT / CWT	SHT ┴ APT / CWT
13	PASS / 3AFOT ┬ 3FFOT	PASS / 3FFOT ┬ 3A FOT	31	STG ├ PASS / VOID	PASS / VOID ┤ STG
14	3AFOT ┴ 3F FOT / 3BWBT	3FFOT ┴ 3A FOT / 3BWBT	32	APT ┐ VOID	VOID ┌ APT
15	PASS / 4FWBT ┬ 3AFOT	PASS / 3AFOT ┬ 4FWBT	33	└ VOID	VOID ┘
16	4FWBT / 4BWBT ┼ 3A FOT / 3BWBT	3A FOT / 3BWBT ┼ 4FWBT / 4BWBT			
17	PASS / 4AWBT ┬ 4FWBT	PASS / 4FWBT ┬ 4AWBT			
18	4AWBT ┴ 4FWBT / 4BWBT	4FWBT ┴ 4AWBT / 4BWBT			

2142085 - 2/

1109

三井造船技術標準 1

船舶事業部標準	タンク標示マーク(ビード) TANK BOUNDARY MARKS	MES SD39443
制定 43.10.8 改正1日 47.2.12 改正2日 47.10.17		



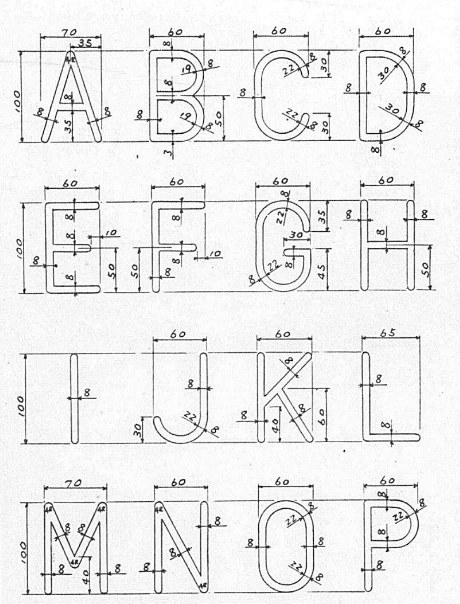
注 1.2の標示マークは、約8mmの溶接ビードとする。

記事	制定者	課長	作成者	幹事	作成部署
					玉船設一設

2142085-3/

三井造船技術標準 2

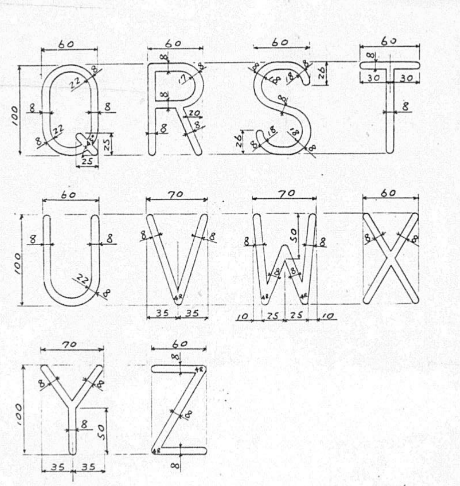
MES SD39443



2142085-4/

三井造船技術標準 3

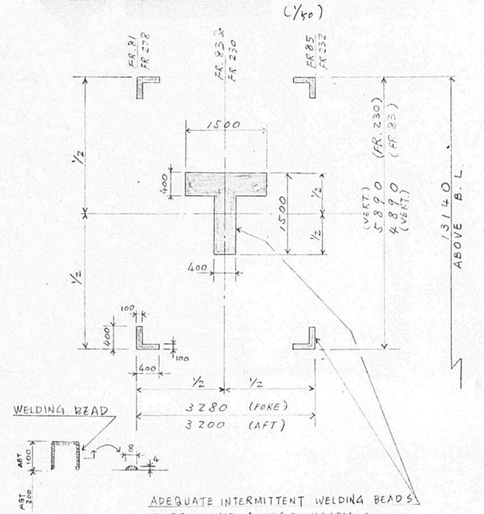
MES SD39443



2142085-5/

Ⓑ TUG PUSH MARK (P&S)

(1/50)



2142085-6/6

APPROVAL OF OWNER & REGULATORY BODIES

ALT. NO.	OWNER DATE	LETTER NO.	DATE	LETTER NO.	DATE	LETTER NO.
ORIGINAL	OCT. 31 '85	OFTS/NAB/CP OFTS/MES-1024				
REV. A	DEC. 12 '85	TX. NO. OFTS/MES-1136				

FINISHEDPLAN

SHIPYARD AND SHIP'S NO. & NAME

MITSUI TAMANO		MITSUBISHI KOBE	
NO.1323	DOCTOR LYKES	NO.1158	JAMES LYKES
NO.1324	ALMERIA LYKES	NO.1159	JOSEPH LYKES
NO.1325	TILLIE LYKES	NO.1164	SOLON TURMAN

MITSUI ENGINEERING & SHIPBUILDING CO., LTD.
TAMANO WORKS

SHIP DESIGN DEPARTMENT — SHIP'S NO. 1325 — SHIP'S NAME TILLIE LYKES

OUTFIT DESIGN SECT (PIPING)

COLOUR SCHEDULE OF PIPING IN ENGINE ROOM

LYKES REF. NO. 280304 — MITSUI DRAWING NO. 5131104 — REV.

(7 SHEETS WITH COVER)

PLAN RECORD ①

ALT. NO.	MARK	ALTERATION/DESCRIPTION	DATE & SIGNATURE
		PREPARED FOR S. No. 1323 AS FINISHED PLAN, MADE APPLICABLE TO S. No. 1324 AND S. No. 1325.	JUN. 26 '86

DWG. NO. 5131104 1

GENERAL NOTE ②

THE REVISED DRAWING (DWG. NO. 5131104-A) WAS PREPARED ACCORDING TO OWNER'S LETTER OF 31ST OCTOBER, 1985 AND DISCUSSION MEMORANDUM No. 41 (PAINT) DATED ON 1ST NOVEMBER, 1985.

DWG. NO. 5131104

REFERENCE DRAWING ③

NO.	REV. NO.	DWG. NO.	DWG. NAME

DWG. NO. 5131104

(4)

Pipe & Valve Colour Identit

1 General

Identification of pipes should be done with colour paint according to owner's standard colour coding system.

5131104

2 Remarks

1) The pipes both above and below floor in engine room shall be painted on all surface with mentioned colour respectively. (Fig. 2.3 & 4)

3) ~~Double band colour code, flow direction and letters should be applied for only C.C. piping~~ as ~~shown in the FIG.2~~.

4) As for the valve painting, only valve handles situated above floor should be painted, on the other hand valve body and the handle should be should be painted for the valves situated below the floor as shown in the FIG.5.

5) Potable water pipe lines of inside engine room shall be completely painted light blue as allowed by USPH regulation (Sec. A-15). Potable water pipe lines of outside engine room shall be striped with 6 inch (152 mm) light blue paint band in compliance with USPH regulation. (Fig. 6)

(5)

PIPING IN ENGINE ROOM (BOTH ABOVE AND BELOW FLOOR)

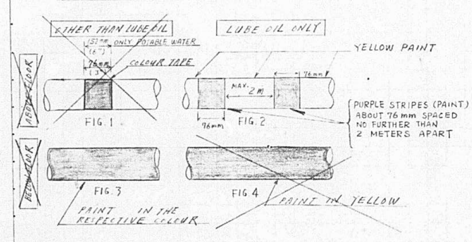
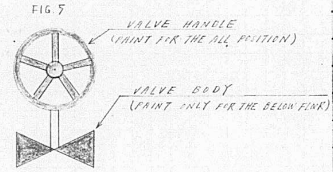


FIG.1 FIG.2 FIG.3 FIG.4

5131104

FIG.5



POTABLE WATER PIPING (OUTSIDE ENGINE ROOM)

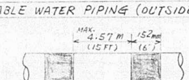


FIG.6

STRIPED WITH 6INCH (152mm) LIGHT BLUE PAINT BAND AND NOT TO EXCEED 15 FEET IN ALL SPACE EXCEPT QUARTERS, DINING ROOMS, SALONS, AND SIMILAR PUBLIC PLACES WHERE THE DECOR WOULD BE MARRED BY SUCH MARKINGS ACCORDING TO USPH REGULATION.

1/4

APPROVAL OF OWNER & REGULATORY BODIES						
ALT. NO.	OWNER					
	DATE	LETTER NO.	DATE	LETTER NO.	DATE	LETTER NO.
ORIGINAL	24 JUN '85	OFTS/MES-604				

FINISHEDPLAN

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TOTAL 4 SHEETS WITH COVER.

SHIPYARD AND SHIP'S NO. & NAME			
MITSUI TAMANO		MITSUBISHI KOBE	
NO.1323	DOCTOR LYKES	NO.1158	JAMES LYKES
NO.1324	ALMERIA LYKES	NO.1159	JOSEPH LYKES
NO.1325	TILLIE LYKES	NO.1164	SOLON TURMAN

MITSUI ENGINEERING & SHIPBUILDING CO.,LTD.
TAMANO WORKS

SHIP DESIGN DEPARTMENT MANAGER
SHIP'S NO.
SHIP'S NAME: TILLIE LYKES
OUTFIT DESIGN SECT (PIPING)
SEC. CHIEF
FUNNEL MARK
DATE (TEL 2240)
JOB NO. TS 1323/24/25
SCALE 1/100, 1/50, 1/25
LYKES REF. NO. 280401
MITSUI DRAWING NO. 5173003

3/4

PLAN RECORD

ALT. NO.	MARK	ALTERATION/DESCRIPTION	DATE & SIGNATURE
		PREPARED FOR S.NO.1323 AS FINISHED PLAN, MADE APPLICABLE TO S.NO.1324 AND S.NO.1325.	JUNE 27 '86

DWG.NO. 5173003

3/4

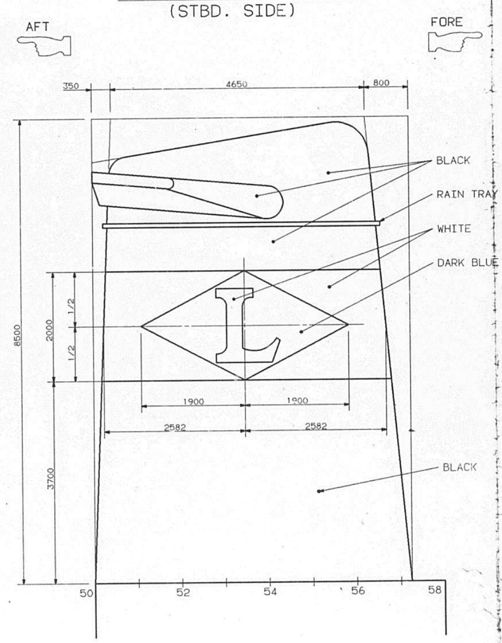
GENERAL NOTE

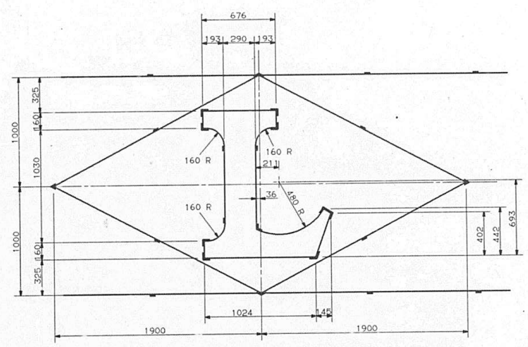
DWG.NO. 5173003

1113

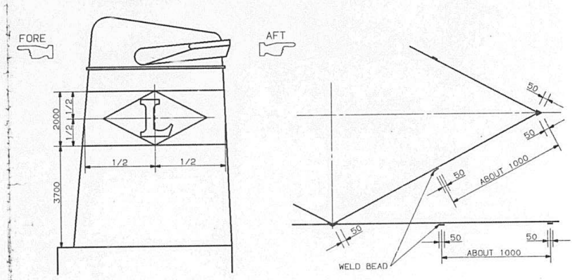
4/4

ELEVATION (S=1/50)
(STBD. SIDE)





ELEVATION (S=100)
(PORT SIDE)



REMARK

1 FUNNEL MARK TO BE INDICATED WITH SPOT WELD BEAD.

TS1323/24/25 DWG.NO.5173003

APPROVAL OF OWNER & REGULATORY BODIES								
ALT.NO.	OWNER		USCG		ABS		USPH	
	DATE	LETTER NO.	DATE	LETTER NO.	DATE	LETTER NO.	DATE	LETTER NO.
ORIGINAL	25TH FEB. 1985	CFTS/MES/113			14TH MAR. 1985	SCH/8-		
REV-A	24 APR. 85	CFTS/MES-1266			1985	SCH/81 T-8-2		

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NO.1325	TILLIE LYKES	NO.1164	SOLON TURMAN

MITSUI ENGINEERING & SHIPBUILDING CO.,LTD.
TAMANO WORKS

FINISHED PLAN

SHIP DESIGN DEPARTMENT
MANAGER

SHIP'S NO. **1325** SHIP'S NAME **TILLIE LYKES**

CO-ORDINATION SECTION
SEC. CHIEF
ASSIST. CHIEF 5.1987
CHARGE
STAFF K. Azuma
DATE (TEL 2222)

DRAFT MARKS

吃　水　マ　ー　ク

JOB NO. TS1323/24/25
JOBCLASSIF. NO.

SCALE —

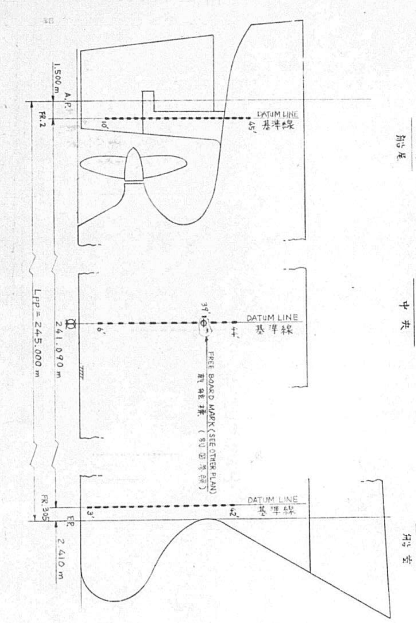
LYKES REF. NO. 280601

MITSUI DRAWING NO. 1102175

(7 SHEETS WITH COVER)

ALT.NO.	MARK	PLAN RECORD ALTERATION/DESCRIPTION	DATE & SIGNATURE
		PREPARED FOR S. NO. 1323 AS FINISHED PLAN, MADE APPLICABLE TO S. NO. 1324 AND S. NO. 1325.	NOV. 10, 1986 K.A.

LOCATION OF DRAFT MARKS
吃水マーク取付位置



NOTE

(1) Location of draft marks on page 3 shows for starboard side. Those for port side is to be symmetrical about center line of ship. And center of the last figure is to be set on datum line.
(Refer to the figure on page 4)

(2) The marks are to be Arabic Numerals of 6 inches projected height and located at 1 foot apart vertically.
Bottom of each figure indicates vertical height in feet above bottom of keel (40 mm below base line).

(3) The figures of draft marks to be marked with weld bead on the shell plating.

(4) As for finishing colour and paint schedule of draft marks, see "Painting Schedule (Dwg. No. 3000001)".

(5) Range of marks :

Fore	from	3 feet	to	42 feet	(both sides)
Midship	from	6 feet	to	44 feet	(")
Aft	from	10 feet	to	45 feet	(")

(6) Style of letters to be shown on page 5.

注　記

(1) 3頁の吃水マーク位置は右舷側を示す。左舷側は船体中心線に対して対称とする。また各数字の最下桁が基準線に一致するように配置する。
（4頁　参照）

(2) 吃水マークは 1 フィート 毎に 6 インチ 高さのアラビア数字で表示する。
各数字の下縁が竜骨下面（B.L.下 40 mm）よりの垂直高さを示す。

(3) 吃水マークは ~~4.5 mm厚の鋼板とし、~~ 文字の周囲を連続溶接にて ~~外板に取付けのこと。~~ 表示する。

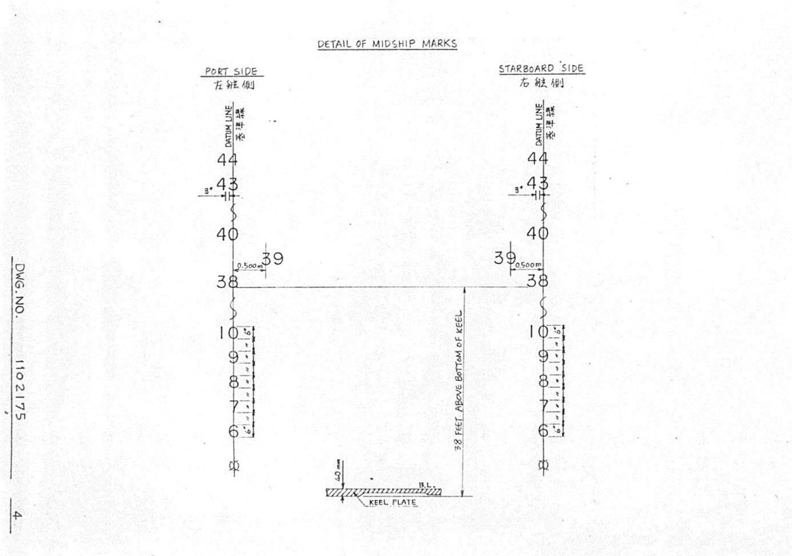
(4) 塗装要領は，＂塗装要領＂（図番 3000001）によること。

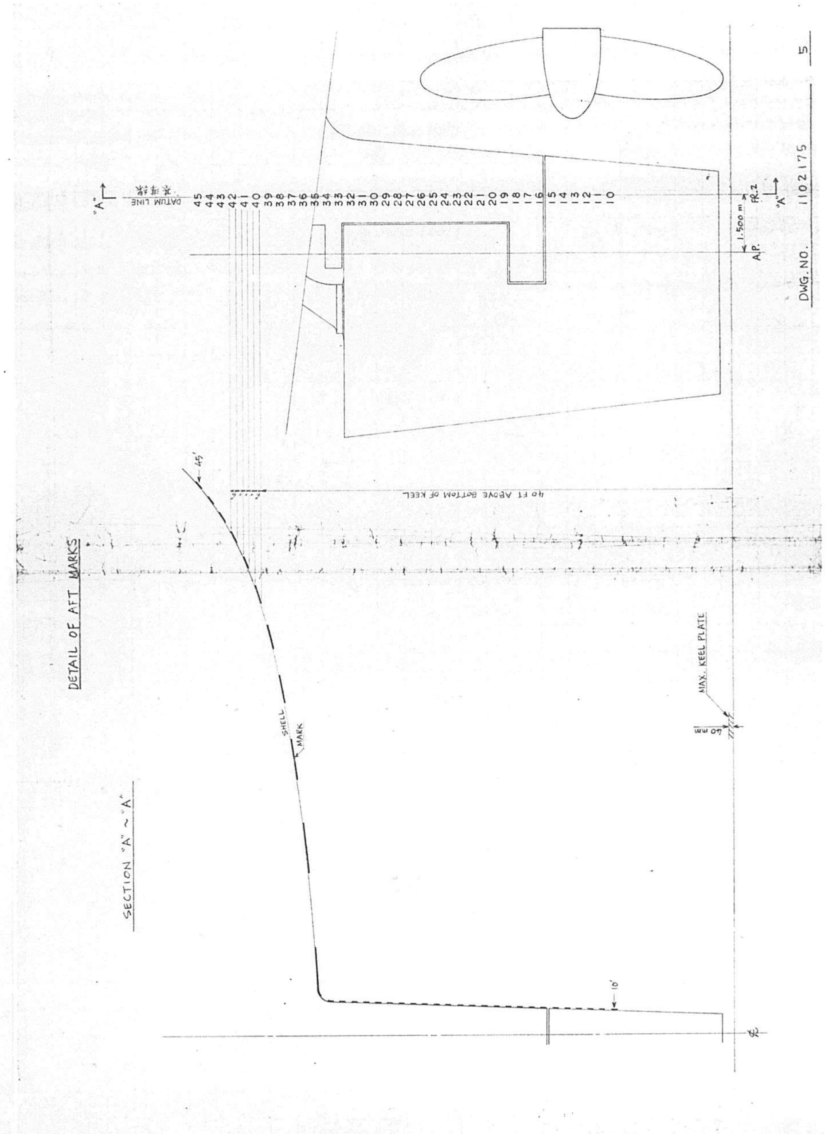
(5) 吃水マークの表示範囲；

					製作枚数
船首	3 フィート	より	42 フィート	まで（両舷）	73×2=146
中央	6 フィート	より	44 フィート	まで（〃）	76×2=152
船尾	10 フィート	より	45 フィート	まで（〃）	72×2=144

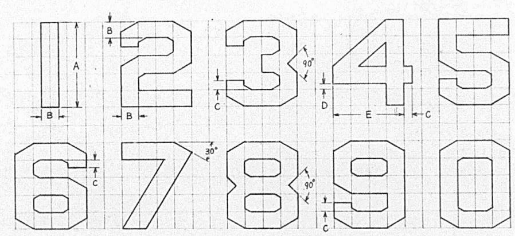
(6) 吃水マークの字体は 5頁に示す。

1115


DETAIL OF MIDSHIP MARKS
PORT SIDE
左舷側
STARBOARD SIDE
右舷側
DATUM LINE
KEEL PLATE
38 FEET ABOVE BOTTOM OF KEEL
DWG. NO. 1102175 4


DETAIL OF AFT MARKS
SECTION "A" ~ "A"
40 FT ABOVE BOTTOM OF KEEL
SHELL MARK
MAX. KEEL PLATE
DATUM LINE
A.P.
FR.2
DWG. NO. 1102175 5

STYLE OF LETTER



	A	B	C	D	E
INCHES	6	1.2	0.6	0.3	4.8
mm	152.4	30.5	15.2	7.6	121.9

DWG.NO. 1102175 6 (END)

1117

ALT. NO.	OWNER DATE	OWNER LETTER NO.	USCG DATE	USCG LETTER NO.	ABS DATE	ABS LETTER NO.	USPH DATE	USPH LETTER NO.
ORIGINAL	24 APR 86	OPTS/LKES-1266			24 MAR 86	TT/Sy		

APPROVAL OF OWNER & REGULATORY BODIES

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SHIPYARD AND SHIP'S NO. & NAME			
MITSUI TAMANO		MITSUBISHI KOBE	
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NO.1324	ALMERIA LYKES	NO.1159	JOSEPH LYKES
NO.1325	TILLIE LYKES	NO.1164	SOLON TURMAN

MITSUI ENGINEERING & SHIPBUILDING CO., LTD. TAMANO WORKS

FINISHED PLAN

SHIP DESIGN DEPARTMENT MANAGER

SHIP'S NO. 1325 — SHIP'S NAME TILLIE LYKES

CO-ORDINATION SECTION

SEC. CHIEF / ASSIST. CHIEF / CHARGE ENG'R — DESIGN DEPARTMENT

STAFF K. Azuma

DATE (TEL)

FREEBOARD MARK

JOB NO.	SCALE	LYKES REF. NO.	MITSUI DRAWING NO.
TS1323/24/25		280602	1102172
JOBCLASSIF. NO.			

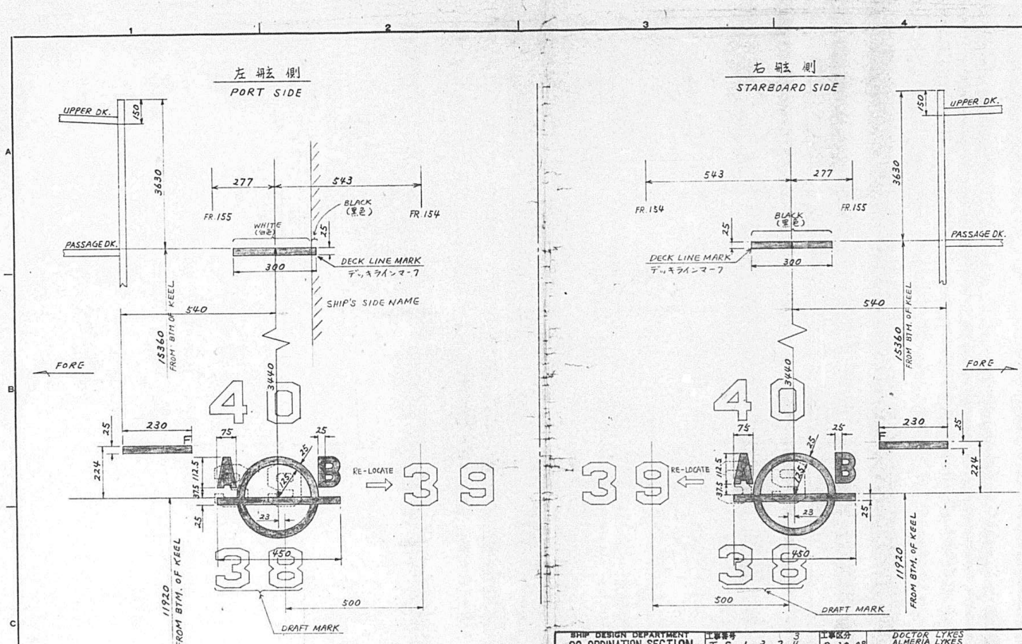
(3 SHEETS WITH COVER)

PLAN RECORD

ALT. NO.	MARK	ALTERATION/DESCRIPTION	DATE & SIGNATURE
		PREPARED FOR S. NO. 1323 AS FINISHED PLAN, MADE	NOV. 10, 1986
		APPLICABLE TO S. NO. 1324 AND S. NO. 1325.	K.A. MA

1

2 (END)



NOTES: 1. THE MARKS ARE TO BE COMPLETELY OUTLINED WITH WELDED BEAD TO SHELL AND WHITE PAINTED EXCEPT DECK LINE MARKS.
2. UNIT: MM

注 1. マークは溶接ビードにて輪郭をとり白色ペイントのこと。(デッキラインマークは上図による)
2. 単位は MM

SHIP DESIGN DEPARTMENT CO-ORDINATION SECTION	工事番号 T.S.1.3.2.3/4/5.	工事区分 0.20.08	DOCTOR LYKES ALMERIA LYKES TILLIE LYKES
SEC. CHIEF			
ASSIST. CHIEF	M. Aoyama	フリーボードマーク	
CHARGE ENG'R		FREEBOARD MARK	
STAFF	K. Azuma		
DRAWER			
DATE			
試験方 / TEST / SCALE 1/10	CLASSIFICATION NO.	DRAWING NO. 1102172	

MITSUI ENGINEERING & SHIPBUILDING CO., LTD.

1118

APPROVAL OF OWNER & REGULATORY BODIES

ALT. NO.	OWNER DATE	OWNER LETTER NO.	USCG DATE	USCG LETTER NO.	ABS DATE	ABS LETTER NO.	USPH DATE	USPH LETTER NO.
ORIGINAL					22 JAN '86	JC/mf		
REV A	FEB. 10 1986	MTS/MES-1197						

SHIPYARD AND SHIP'S NO. & NAME

MITSUI TAMANO		MITSUBISHI KOBE	
NO.1323	DOCTOR LYKES	NO.1158	JAMES LYKES
NO.1324	ALMERIA LYKES	NO.1159	JOSEPH LYKES
NO.1325	TILLIE LYKES	NO.1164	SOLON TURMAN

MITSUI ENGINEERING & SHIPBUILDING CO., LTD.
TAMANO WORKS
FINISHED PLAN

SHIP DESIGN DEPARTMENT MANAGER
SHIP'S NO. 1325
SHIP'S NAME TILLIE LYKES

CO-ORDINATION SECTION
STAFF
DATE (TEL)

TANK PROPERTIES

JOB NO. TS1323/24/25
JOB CLASSIF. NO.
SCALE
LYKES REF. NO. 290101
MITSUI DRAWING NO. 1102051

(50 SHEETS WITH COVER)

PLAN RECORD

ALT. NO.	MARK	ALTERATION/DESCRIPTION	DATE & SIGNATURE
		PREPARED FOR S. NO. 1323 AS FINISHED PLAN, MADE	NOV. 10, 1986
		APPLICABLE TO S. NO. 1324 AND S. NO. 1325.	K.A. MA

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GENERAL NOTES

1. Ship is assumed level without heel or trim.

2. Calculated by General Arrangement and construction drawings as of April 27, 1985 with structural deductions as follows.

Deep tanks	:	1 %
Side tanks	:	1 %
Bottom tanks	:	2 %
Aft peak tanks	:	1.5 %
Other tanks	:	1 %

3. Key to symbols

   VOLUME : Volume of each compartment
   LCG : Longitudinal Center of Gravity from midship (⊠)
   VCG : Vertical Center of Gravity above top of keel (i.e. base line)
   TCG : Transverse Center of Gravity from center line (℄)
   I : Transverse moment of Inertia of free surface

   Reference lines-

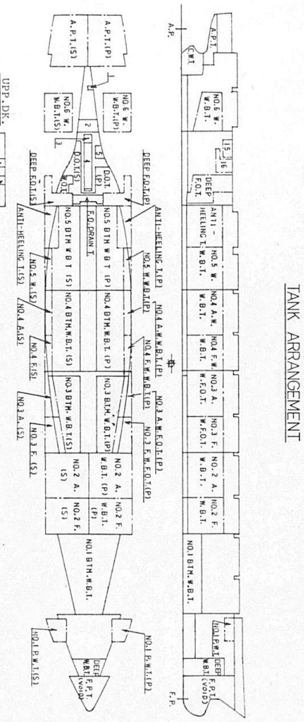
   LCG .... Minus sign (-) : Forward of midship (⊠)
   No sign : Aft of midship (⊠)
   TCG .... Minus sign (-) : Port of center line (℄)
   No sign : Starboard of center line (℄)

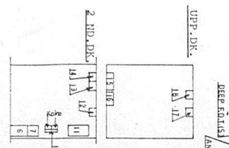
4. Sounding scales ought to be prepared separately as follows.

Dwg. No.	Title
1102054	SOUNDING TABLES

1119

TANK ARRANGEMENT





NO	TANK NAME	NO	TANK NAME
1	S/T L.O.DRAIN T.	11	H.F.O.SETT.T.(P)
2	BILGE TANK	12	D.O.SETT.T.
3	BTM.RESERVE L.O.T.	13	SOOT CLEAN W.T.
4	BTM.L.O.SUMP.T.	14	DIST.W.T.
5	CLEAN DRAIN T.	15	CYL.O.STOR.T.
6	H.F.O.SETT.T.(S)	16	NO.2 P.W.T.
7	H.F.O.SERV.T.	17	D.O.SERV.T.
8	D.O.SLUDGE T.	18	M/E L.O.STOR.T.
9	H.F.O.SLUDGE T.		
10	L.O.SLUDGE T.		

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TANK CAPACITY TABLE

WATER BALLAST TANKS

S.G.= 1.025

COMPARTMENT		LOCATION (FR.NO.)	CAPACITY 100% (M^3)	WEIGHT 100% (MT)	CENTER OF GRAVITY (M) LCG	VCG	TCG	MAX.F.S. (MT-M)
DEEP W.B.T.		287-296	371.4	380.7	-110.28	9.23	0.0	371
NO.1 BTM. W.B.T.		230-266	1527.1	1565.3	-76.10	3.92	0.0	9422
NO.2 F. W.B.T.	P	214-230	552.0	565.8	-55.07	7.12	-10.07	287
	S	214-230	552.0	565.8	-55.07	7.12	10.07	287
NO.2 A. W.B.T.	P	194-214	769.9	789.1	-40.20	6.63	-10.88	1131
	S	194-214	770.7	790.0	-40.24	6.63	10.87	1138
NO.3 BTM. W.B.T.	P	160-194	402.6	412.7	-16.74	0.98	-7.37	2503
	S	160-194	402.6	412.7	-16.74	0.98	7.37	2503
NO.4 F.W. W.B.T.	P	142-158	469.1	480.8	3.82	8.61	-14.74	23
	S	142-158	469.1	480.8	3.82	8.61	14.74	23
NO.4 BTM. W.B.T.	P	122-158	608.4	623.6	12.19	0.92	-8.94	4995
	S	122-158	608.4	623.6	12.19	0.92	8.94	4995
NO.4 A.W. W.B.T.	P	122-142	590.8	605.6	18.56	8.56	-14.75	28
	S	122-142	590.8	605.6	18.56	8.56	14.75	28
NO.5 BTM. W.B.T.	P	84-122	518.7	531.7	40.47	0.96	-8.12	3932
	S	84-122	518.7	531.7	40.47	0.96	8.12	3932
NO.5 WING W.B.T.	P	103-122	552.8	566.6	34.50	8.65	-14.73	27
	S	103-122	552.8	566.6	34.50	8.65	14.73	27
NO.6 WING W.B.T.	P	31- 50	566.0	580.2	91.13	10.07	-11.29	828
	S	31- 50	566.0	580.2	91.13	10.07	11.29	828
AFT PEAK T.	P	A.E.-16	442.3	453.4	118.16	12.12	-5.65	2982
	S	A.E.-16	450.7	462.0	118.29	12.13	5.56	3115
ANTI-HEELING T.	P	84-103	600.9	615.9	49.83	8.13	-14.21	158
	S	84-103	600.9	615.9	49.83	8.13	14.21	158
TOTAL			14054.7	14406.3	-	-	-	-

FRESH WATER TANKS

S.G.= 1.000

COMPARTMENT		LOCATION (FR.NO.)	CAPACITY 100% (M^3)	WEIGHT 100% (MT)	CENTER OF GRAVITY (M) LCG	VCG	TCG	MAX.F.S. (MT-M)
NO.1 POT. W.T.	P	268-279	116.5	116.5	-96.62	17.44	-10.64	219
	S	268-279	116.5	116.5	-96.62	17.44	10.64	219
NO.2 POT. W.T.		58- 69	111.4	111.4	73.09	14.95	14.69	14
DIST. W.T.		54- 58	30.6	30.6	80.10	13.51	-14.75	5
TOTAL			375.0	375.0	-	-	-	-
COOL. W.T.		A.E.- 21	90.1	90.1	109.45	4.60	0.00	11

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FUEL OIL TANKS

H(HEAVY OIL) : S.G.= 0.980
I(INTERMEDIATE OIL): S.G.= 0.940

COMPARTMENT		LOCATION (FR.NO.)	CAPACITY 100% EXCEPT * (M^3)	WEIGHT 98% OR * (MT) H	I	CENTER OF GRAVITY (M) LCG	VCG	TCG	MAX.F.S. (MT-M) H	I
NO.3 F.W. F.O.T.	P	178-194	466.7	448.2	429.9	-25.76	8.43	-14.17	37	36
	S	178-194	466.7	448.2	429.9	-25.76	8.43	14.17	37	36
NO.3 A.W. F.O.T.	P	158-178	567.8	545.3	523.1	-10.94	8.65	-14.65	26	25
	S	158-178	567.8	545.3	523.1	-10.94	8.65	14.65	26	25
DEEP F.O.T.	P	70- 83	* 468.9	459.5	440.8	62.01	7.88	-12.32	548	525
	S	70- 83	* 476.5	467.0	447.9	62.83	8.26	12.36	550	527
H.F.O. SETT. T.	P	78- 83	* 118.2	115.8	111.1	60.57	10.40	-9.49	156	149
	S	78- 83	* 117.4	115.1	110.4	60.53	11.52	12.69	80	77
H.F.O. SERV. T.		78- 83	* 121.7	119.3	114.4	60.61	12.12	7.71	25	24
TOTAL			3371.7	3263.7	3130.6	-	-	-	-	
F.O. DRAIN T.		79- 83	56.5	54.3	52.0	60.41	1.05	0.0	349	335
H.F.O. SLUDGE T.		78- 80	* 1.7	1.7	1.6	61.70	7.13	1.85	2	2

DIESEL OIL TANKS

S.G.= 0.900

COMPARTMENT		LOCATION (FR.NO.)	CAPACITY 100% EXCEPT * (M^3)	WEIGHT 98% OR * (MT)	CENTER OF GRAVITY (M) LCG	VCG	TCG	MAX.F.S. (MT-M)
DIESEL OIL T.	P	66- 79	86.7	76.5	66.27	1.54	-4.68	276
	S	54- 79	101.0	89.1	69.33	1.50	3.93	96
D.O. SETT. T.		70- 74	* 23.1	20.8	67.30	13.06	-14.75	5
D.O. SERV. T.		70- 74	* 22.8	20.5	67.28	16.62	-14.75	5
TOTAL			233.6	206.9	-	-	-	-
D.O. SLUDGE T.		78- 80	* 1.5	1.4	61.70	7.13	-0.39	1

LUB. OIL TANKS

S.G.= 0.900

COMPARTMENT	LOCATION (FR.NO.)	CAPACITY 100% EXCEPT * (M^3)	WEIGHT 98% OR * (MT)	CENTER OF GRAVITY (M) LCG	VCG	TCG	MAX.F.S. (MT-M)
M/E L.O. STOR. T.	62- 66	60.8	53.6	73.70	15.19	-14.75	5
BTM. RESERVE L.O.T.	51- 77	56.6	49.9	74.62	0.53	0.0	41
BTM. L.O. SUMP. T.	55- 76	47.9	42.2	72.53	1.23	0.0	33
TOTAL		165.3	145.7	-	-	-	-
L.O. SLUDGE T.	80- 82	* 3.2	2.9	60.10	7.13	0.79	11
S/T L.O. DRAIN T.	29- 34	5.9	5.2	98.88	2.07	0.0	2
CYL.O. STOR. T.	54- 62	59.9	52.8	78.50	[illegible].03	14.75	10

MISCELLANEOUS TANKS

S.G.= 1.000

COMPARTMENT	LOCATION (FR.NO.)	CAPACITY 100% (M^3)	WEIGHT 100% (MT)	CENTER OF GRAVITY (M) LCG	VCG	TCG	MAX.F.S. (MT-M)
SOOT CLEAN WATER T.	54- 62	40.9	40.9	78.41	9.57	-14.53	9
CLEAN DRAIN T.	54- 62	17.8	17.8	78.14	1.68	-3.54	6
WASTE OIL T.	70- 78	17.8	17.8	65.60	2.01	7.78	36
BILGE T.	44- 50	62.4	62.4	87.13	1.41	0.0	153

Notes : 1. The capacities with * mark shows the value to overflow pipe.
2. Weights for FO, DO and LO are at 98% full unless capacity has * mark where weight is calculated to overflow pipe.

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DEEP W.B.T.

VOLUME (CUB.M)	LCG (METER)	VCG (METER)	TCG (METER)	I (M**4)
0.0	-	0.0	-	-
10.0	-110.53	0.76	0.0	3.
20.0	-110.53	1.23	0.0	6.
30.0	-110.52	1.61	0.0	10.
40.0	-110.51	1.96	0.0	13.
50.0	-110.51	2.28	0.0	15.
60.0	-110.51	2.58	0.0	17.
70.0	-110.50	2.87	0.0	19.
80.0	-110.50	3.14	0.0	20.
90.0	-110.49	3.41	0.0	21.
100.0	-110.49	3.67	0.0	23.
110.0	-110.48	3.93	0.0	23.
120.0	-110.48	4.18	0.0	25.
130.0	-110.47	4.43	0.0	27.
140.0	-110.46	4.68	0.0	28.
150.0	-110.46	4.92	0.0	30.
160.0	-110.45	5.15	0.0	32.
170.0	-110.45	5.39	0.0	36.
180.0	-110.44	5.62	0.0	41.
190.0	-110.43	5.84	0.0	45.
200.0	-110.43	6.07	0.0	50.
210.0	-110.43	6.28	0.0	58.
220.0	-110.43	6.50	0.0	66.
230.0	-110.43	6.71	0.0	76.
240.0	-110.42	6.91	0.0	88.
250.0	-110.40	7.11	0.0	101.
260.0	-110.40	7.31	0.0	116.
270.0	-110.39	7.50	0.0	133.
280.0	-110.39	7.69	0.0	152.
290.0	-110.39	7.87	0.0	173.
300.0	-110.39	8.05	0.0	197.
310.0	-110.39	8.23	0.0	223.
320.0	-110.40	8.40	0.0	252.
330.0	-110.40	8.56	0.0	284.
340.0	-110.40	8.73	0.0	320.
(350.9)	(-110.38)	(8.90)	(0.0)	(362) I MAX.
360.0	-110.34	9.04	0.0	226.
370.0	-110.29	9.20	0.0	289.
371.4	-110.28	9.23	0.0	0.

1120

NO.1 BTM.W.B.T.

VOLUME (CUB.M)	LCG (METER)	VCG (METER)	TCG (METER)	I (M**4)
0.0	-	0.0	-	-
50.0	-74.73	0.43	0.0	143.
100.0	-74.61	0.69	0.0	343.
150.0	-74.56	0.89	0.0	568.
200.0	-74.53	1.07	0.0	811.
250.0	-74.50	1.23	0.0	1068.
300.0	-74.49	1.37	0.0	1335.
350.0	-74.48	1.51	0.0	1612.
400.0	-74.47	1.64	0.0	1896.
450.0	-74.46	1.76	0.0	2186.
500.0	-74.45	1.88	0.0	2484.
550.0	-74.45	1.99	0.0	2787.
600.0	-74.45	2.10	0.0	3096.
650.0	-74.44	2.21	0.0	3409.
700.0	-74.44	2.31	0.0	3836.
750.0	-74.44	2.41	0.0	4032.
800.0	-74.44	2.50	0.0	4360.
850.0	-74.44	2.60	0.0	4691.
900.0	-74.45	2.69	0.0	5027.
950.0	-74.54	2.78	0.0	4438.
1000.0	-74.72	2.87	0.0	4734.
1050.0	-74.89	2.97	0.0	5149.
1100.0	-75.05	3.06	0.0	5566.
1150.0	-75.20	3.16	0.0	5987.
1200.0	-75.34	3.26	0.0	6409.
1250.0	-75.47	3.36	0.0	6833.
1300.0	-75.60	3.46	0.0	7257.
1350.0	-75.71	3.56	0.0	7683.
1400.0	-75.83	3.66	0.0	8109.
1450.0	-75.94	3.76	0.0	8535.
1500.0	-76.04	3.86	0.0	8961.
1527.1	-76.10	3.92	0.0	0.
				(9192) I MAX.

NO.2 F.W.B.TK. (P/S)

VOLUME (CUB.M)	LCG (METER)	VCG (METER)	TCG (METER)	I (M**4)
0.0	-	0.0	-	-
10.0	-54.55	0.24	±0.92	25.
20.0	-54.59	0.39	±1.28	53.
30.0	-54.62	0.52	±1.50	83.
40.0	-54.65	0.64	±1.68	113.
50.0	-54.67	0.73	±1.82	145.
60.0	-54.69	0.83	±1.95	177.
70.0	-54.70	0.92	±2.07	209.
80.0	-54.72	1.00	±2.18	242.
90.0	-54.73	1.08	±2.28	275.
(91.5)	(-54.73)	(1.09)	(±2.29)	(280) I MAX.
100.0	-54.76	1.17	±2.57	22.
110.0	-54.80	1.27	±2.90	29.
120.0	-54.82	1.39	±3.21	34.
130.0	-54.84	1.51	±3.50	39.
140.0	-54.86	1.63	±3.77	43.
150.0	-54.88	1.76	±4.04	47.
160.0	-54.89	1.89	±4.29	50.
170.0	-54.90	2.01	±4.52	53.
180.0	-54.91	2.14	±4.75	55.
190.0	-54.92	2.27	±4.96	57.
200.0	-54.93	2.39	±5.17	58.
210.0	-54.94	2.52	±5.37	59.
220.0	-54.95	2.64	±5.57	59.
230.0	-54.96	2.77	±5.75	59.
240.0	-54.96	2.89	±5.93	58.
250.0	-54.97	3.02	±6.11	58.
260.0	-54.98	3.14	±6.28	57.
270.0	-54.99	3.26	±6.45	55.
280.0	-55.00	3.39	±6.61	54.
290.0	-55.00	3.51	±6.77	51.
300.0	-55.00	3.63	±6.93	49.
310.0	-55.01	3.75	±7.08	46.
320.0	-55.03	3.88	±7.23	44.
330.0	-55.04	4.00	±7.38	41.
340.0	-55.05	4.13	±7.52	38.
350.0	-55.05	4.25	±7.67	34.
360.0	-55.06	4.38	±7.81	31.
370.0	-55.08	4.50	±7.95	25.
380.0	-55.08	4.63	±8.09	19.
390.0	-55.09	4.77	±8.23	19.
400.0	-55.10	4.90	±8.37	16.
410.0	-55.10	5.04	±8.51	13.
420.0	-55.10	5.17	±8.64	11.
430.0	-55.09	5.32	±8.78	11.
440.0	-55.09	5.46	±8.90	12.
450.0	-55.08	5.60	±9.03	13.
460.0	-55.08	5.75	±9.15	14.
470.0	-55.07	5.90	±9.26	15.
480.0	-55.06	6.05	±9.38	17.
490.0	-55.06	6.20	±9.48	18.
500.0	-55.06	6.34	±9.59	19.
510.0	-55.07	6.49	±9.69	19.
520.0	-55.07	6.64	±9.78	20.
530.0	-55.07	6.79	±9.88	20.
540.0	-55.07	6.94	±9.97	21.
550.0	-55.07	7.09	±10.05	21.
552.0	-55.07	7.12	±10.07	0.

NO.2 A.W.B.T. (P SIDE)

VOLUME (CUB.M)	LCG (METER)	VCG (METER)	TCG (METER)	I (M**4)
0.0	-	0.0	-	-
20.0	-39.33	0.18	-1.56	161.
40.0	-39.36	0.33	-2.53	302.
60.0	-39.43	0.45	-2.90	423.
80.0	-39.54	0.55	-2.84	547.
100.0	-39.60	0.65	-3.01	643.
120.0	-39.65	0.75	-3.17	754.
140.0	-39.69	0.84	-3.32	863.
160.0	-39.73	0.93	-3.45	969.
180.0	-39.76	1.01	-3.57	1071.
(186.4)	(-39.76)	(1.03)	(-3.60)	(1103) I MAX.
200.0	-39.79	1.10	-3.93	51.
220.0	-39.83	1.22	-4.40	64.
240.0	-39.88	1.35	-4.84	73.
260.0	-39.92	1.50	-5.25	79.
280.0	-39.95	1.66	-5.63	82.
300.0	-39.99	1.81	-5.98	82.
320.0	-40.02	1.98	-6.32	80.
340.0	-40.05	2.14	-6.64	77.
360.0	-40.08	2.31	-6.94	72.
380.0	-40.11	2.48	-7.23	65.
400.0	-40.15	2.66	-7.51	57.
420.0	-40.18	2.84	-7.78	49.
440.0	-40.20	3.02	-8.04	8.
460.0	-40.16	3.21	-8.32	12.
480.0	-40.14	3.42	-8.57	16.
500.0	-40.12	3.63	-8.81	18.
520.0	-40.12	3.84	-9.03	21.
540.0	-40.12	4.06	-9.24	23.
560.0	-40.12	4.28	-9.43	24.
580.0	-40.13	4.50	-9.62	25.
600.0	-40.14	4.73	-9.79	26.
620.0	-40.14	4.95	-9.95	26.
640.0	-40.15	5.17	-10.10	27.
660.0	-40.16	5.40	-10.24	27.
680.0	-40.17	5.62	-10.37	27.
700.0	-40.18	5.85	-10.49	27.
720.0	-40.19	6.07	-10.61	27.
740.0	-40.20	6.30	-10.72	27.
760.0	-40.20	6.52	-10.83	27.
769.9	-40.20	6.63	-10.88	0.

NO.2 A.W.B.TK. (S SIDE)

VOLUME (CUB.M)	LCG (METER)	VCG (METER)	TCG (METER)	I (M**4)
0.0	-	0.0	-	-
20.0	-39.55	0.18	1.55	161.
40.0	-39.57	0.33	2.51	302.
60.0	-39.63	0.45	2.88	423.
80.0	-39.72	0.55	2.82	551.
100.0	-39.77	0.65	3.00	644.
120.0	-39.82	0.74	3.15	756.
140.0	-39.85	0.83	3.30	866.
160.0	-39.88	0.92	3.43	971.
180.0	-39.91	1.00	3.55	1074.
(187.2)	(-39.91)	(1.03)	(3.59)	(1110) I MAX.
200.0	-39.93	1.09	3.90	50.
220.0	-39.96	1.21	4.37	63.
240.0	-39.99	1.35	4.81	73.
260.0	-40.02	1.49	5.21	78.
280.0	-40.05	1.65	5.60	81.
300.0	-40.08	1.81	5.96	82.
320.0	-40.10	1.97	6.29	80.
340.0	-40.13	2.13	6.61	77.
360.0	-40.16	2.30	6.92	72.
380.0	-40.19	2.47	7.21	66.
400.0	-40.21	2.65	7.49	58.
420.0	-40.24	2.82	7.75	49.
440.0	-40.27	3.01	8.02	8.
460.0	-40.22	3.20	8.29	12.
480.0	-40.20	3.40	8.55	15.
500.0	-40.18	3.61	8.79	18.
520.0	-40.17	3.83	9.01	21.
540.0	-40.17	4.05	9.22	23.
560.0	-40.17	4.27	9.41	24.
580.0	-40.17	4.49	9.60	25.
600.0	-40.18	4.71	9.77	26.
620.0	-40.19	4.94	9.93	26.
640.0	-40.19	5.16	10.08	27.
660.0	-40.20	5.38	10.22	27.
680.0	-40.21	5.61	10.35	27.
700.0	-40.22	5.83	10.48	27.
720.0	-40.22	6.06	10.60	27.
740.0	-40.23	6.28	10.71	27.
760.0	-40.24	6.51	10.82	27.
770.7	-40.24	6.63	10.87	0.

NO.3 BTM.W.B.TK. (P/S)

VOLUME (CUB.M)	LCG (METER)	VCG (METER)	TCG (METER)	I (M**4)
0.0	-	0.0	-	-
10.0	-14.89	0.04	±5.96	641.
20.0	-15.15	0.07	±6.08	752.
30.0	-15.32	0.10	±6.17	841.
40.0	-15.46	0.13	±6.25	920.
50.0	-15.56	0.16	±6.31	991.
60.0	-15.65	0.19	±6.37	1058.
70.0	-15.73	0.22	±6.43	1122.
80.0	-15.80	0.25	±6.48	1182.
90.0	-15.86	0.27	±6.52	1241.
100.0	-15.92	0.30	±6.57	1297.
110.0	-15.97	0.33	±6.61	1352.
120.0	-16.01	0.35	±6.65	1406.
130.0	-16.06	0.38	±6.69	1458.
140.0	-16.10	0.40	±6.73	1510.
150.0	-16.14	0.43	±6.76	1560.
160.0	-16.17	0.45	±6.80	1608.
170.0	-16.21	0.47	±6.83	1657.
180.0	-16.24	0.50	±6.86	1720.
190.0	-16.27	0.52	±6.89	1734.
200.0	-16.31	0.54	±6.92	1784.
210.0	-16.34	0.57	±6.95	1836.
220.0	-16.37	0.59	±6.97	1880.
230.0	-16.40	0.61	±7.00	1924.
240.0	-16.43	0.64	±7.03	1968.
250.0	-16.45	0.66	±7.05	2011.
260.0	-16.48	0.68	±7.08	2055.
270.0	-16.50	0.70	±7.10	2098.
280.0	-16.53	0.72	±7.12	2140.
290.0	-16.55	0.74	±7.15	2181.
300.0	-16.57	0.77	±7.17	2221.
310.0	-16.59	0.79	±7.19	2261.
320.0	-16.61	0.81	±7.21	2300.
330.0	-16.63	0.83	±7.23	2341.
340.0	-16.65	0.85	±7.25	2373.
350.0	-16.67	0.87	±7.28	2394.
360.0	-16.69	0.89	±7.29	2417.
370.0	-16.70	0.91	±7.31	2409.
380.0	-16.71	0.93	±7.33	2404.
390.0	-16.73	0.95	±7.35	2421.
400.0	-16.74	0.97	±7.36	2438.
402.6	-16.74	0.98	±7.37	0.
				(2442) I MAX.

NO.4 BTM.W.B.TK. (P/S)

VOLUME (CUB.M)	LCG (METER)	VCG (METER)	TCG (METER)	I (M**4)
0.0	-	0.0	-	-
20.0	12.39	0.03	±8.08	2731.
40.0	12.37	0.07	±8.18	2949.
60.0	12.36	0.10	±8.25	3117.
80.0	12.35	0.13	±8.30	3260.
100.0	12.34	0.17	±8.35	3387.
120.0	12.33	0.20	±8.40	3501.
140.0	12.32	0.23	±8.44	3606.
160.0	12.31	0.26	±8.47	3703.
180.0	12.31	0.29	±8.51	3794.
200.0	12.30	0.32	±8.54	3880.
220.0	12.30	0.35	±8.57	3962.
240.0	12.29	0.38	±8.60	4039.
260.0	12.28	0.41	±8.62	4112.
280.0	12.28	0.44	±8.65	4182.
300.0	12.27	0.47	±8.67	4258.
320.0	12.27	0.50	±8.69	4285.
340.0	12.26	0.53	±8.71	4355.
360.0	12.25	0.56	±8.74	4413.
380.0	12.24	0.59	±8.75	4469.
400.0	12.24	0.62	±8.77	4524.
420.0	12.23	0.65	±8.79	4577.
440.0	12.23	0.68	±8.81	4627.
460.0	12.22	0.71	±8.83	4675.
480.0	12.22	0.74	±8.84	4720.
500.0	12.21	0.77	±8.86	4762.
520.0	12.21	0.80	±8.88	4803.
540.0	12.20	0.83	±8.89	4842.
(557.7)	(12.20)	(0.85)	(±8.90)	(4873) I MAX.
560.0	12.19	0.88	±8.92	4808.
600.0	12.19	0.91	±8.93	4841.
608.4	12.19	0.92	±8.94	0.

NO.4 F.WING W.B.TK. (P/S)

VOLUME (CUB.M)	LCG (METER)	VCG (METER)	TCG (METER)	I (M**4)
0.0	-	1.69	-	-
10.0	4.61	1.96	±14.59	14.
20.0	4.09	2.13	±14.56	16.
30.0	4.04	2.29	±14.59	19.
40.0	4.00	2.45	±14.62	20.
50.0	3.97	2.60	±14.64	21.
60.0	3.95	2.75	±14.66	22.
70.0	3.93	2.90	±14.67	22.
80.0	3.91	3.04	±14.68	22.
90.0	3.90	3.19	±14.69	22.
100.0	3.89	3.33	±14.69	22.
110.0	3.88	3.48	±14.70	22.
120.0	3.87	3.62	±14.70	22.
130.0	3.87	3.76	±14.71	22.
140.0	3.86	3.91	±14.71	22.
150.0	3.86	4.05	±14.71	22.
160.0	3.86	4.19	±14.72	22.
170.0	3.85	4.34	±14.72	22.
180.0	3.85	4.48	±14.72	22.
190.0	3.85	4.62	±14.72	22.
200.0	3.84	4.77	±14.72	22.
210.0	3.84	4.91	±14.72	22.
220.0	3.84	5.05	±14.73	22.
230.0	3.84	5.20	±14.73	22.
240.0	3.84	5.34	±14.73	22.
250.0	3.84	5.48	±14.73	22.
260.0	3.83	5.62	±14.73	22.
270.0	3.83	5.77	±14.73	22.
280.0	3.83	5.91	±14.73	22.
290.0	3.83	6.05	±14.73	22.
300.0	3.83	6.20	±14.73	22.
310.0	3.83	6.34	±14.73	22.
320.0	3.83	6.48	±14.73	22.
330.0	3.83	6.62	±14.73	22.
340.0	3.83	6.77	±14.73	22.
350.0	3.83	6.91	±14.73	22.
360.0	3.82	7.05	±14.73	22.
370.0	3.82	7.19	±14.73	22.
380.0	3.82	7.34	±14.74	22.
390.0	3.82	7.48	±14.74	22.
400.0	3.82	7.62	±14.74	22.
410.0	3.82	7.77	±14.74	22.
420.0	3.82	7.91	±14.74	22.
430.0	3.82	8.05	±14.74	22.
440.0	3.82	8.19	±14.74	22.
450.0	3.82	8.34	±14.74	22.
460.0	3.82	8.48	±14.74	22.
469.1	3.82	8.61	±14.74	0.
				(22) I MAX.

NO.4 A.WING W.B.TK. (P/S)

VOLUME (CUB.M)	LCG (METER)	VCG (METER)	TCG (METER)	I (M**4)
0.0	-	1.69	-	-
10.0	20.40	1.90	±14.85	24.
20.0	18.61	2.03	±14.67	25.
30.0	18.59	2.15	±14.69	26.
40.0	18.58	2.27	±14.70	27.
50.0	18.58	2.39	±14.71	27.
60.0	18.57	2.50	±14.72	27.
70.0	18.57	2.62	±14.72	27.
80.0	18.57	2.73	±14.73	27.
90.0	18.57	2.85	±14.73	27.
100.0	18.57	2.96	±14.73	27.
110.0	18.57	3.07	±14.73	27.
120.0	18.57	3.19	±14.73	27.
130.0	18.57	3.30	±14.74	27.
140.0	18.57	3.42	±14.74	27.
150.0	18.57	3.53	±14.74	27.
160.0	18.57	3.65	±14.74	27.
170.0	18.56	3.76	±14.74	27.
180.0	18.56	3.87	±14.74	27.
190.0	18.56	3.99	±14.74	27.
200.0	18.56	4.10	±14.74	27.
210.0	18.56	4.22	±14.74	27.
220.0	18.56	4.33	±14.74	27.
230.0	18.56	4.44	±14.74	27.
240.0	18.56	4.56	±14.74	27.
250.0	18.56	4.67	±14.74	27.
260.0	18.56	4.79	±14.74	27.
270.0	18.56	4.90	±14.74	27.
280.0	18.56	5.01	±14.74	27.
290.0	18.56	5.13	±14.74	27.
300.0	18.56	5.24	±14.74	27.
310.0	18.56	5.36	±14.74	27.
320.0	18.56	5.47	±14.74	27.
330.0	18.56	5.59	±14.74	27.
340.0	18.56	5.70	±14.74	27.
350.0	18.56	5.81	±14.74	27.
360.0	18.56	5.93	±14.74	27.
370.0	18.56	6.04	±14.74	27.
380.0	18.56	6.16	±14.74	27.
390.0	18.56	6.27	±14.74	27.
400.0	18.56	6.38	±14.74	27.
410.0	18.56	6.50	±14.74	27.
420.0	18.56	6.61	±14.75	27.
430.0	18.56	6.73	±14.75	27.
440.0	18.56	6.84	±14.75	27.
450.0	18.56	6.95	±14.75	27.
460.0	18.56	7.07	±14.75	27.
470.0	18.56	7.18	±14.75	27.
480.0	18.56	7.30	±14.75	27.
490.0	18.56	7.41	±14.75	27.
500.0	18.56	7.53	±14.75	27.
510.0	18.56	7.64	±14.75	27.
520.0	18.56	7.75	±14.75	27.
530.0	18.56	7.87	±14.75	27.
540.0	18.56	7.98	±14.75	27.
550.0	18.56	8.10	±14.75	27.
560.0	18.56	8.21	±14.75	27.
570.0	18.56	8.32	±14.75	27.
580.0	18.56	8.44	±14.75	27.
590.0	18.56	8.55	±14.75	27.
590.8	18.56	8.56	±14.75	0.
				(27) I MAX.

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NO.5 BTM.W.B.TK. (P/S)

VOLUME (CUB.M)	LCG (METER)	VCG (METER)	TCG (METER)	I (M**4)
0.0	-	0.0	-	-
10.0	38.10	0.03	±6.93	1472.
20.0	38.32	0.05	±7.00	1613.
30.0	38.48	0.07	±7.06	1727.
40.0	38.62	0.10	±7.11	1824.
50.0	38.74	0.12	±7.16	1912.
60.0	38.84	0.14	±7.20	1993.
70.0	38.94	0.16	±7.24	2071.
80.0	39.03	0.19	±7.27	2145.
90.0	39.11	0.21	±7.31	2214.
100.0	39.18	0.23	±7.34	2279.
110.0	39.25	0.25	±7.37	2341.
120.0	39.31	0.27	±7.40	2401.
130.0	39.37	0.29	±7.43	2459.
140.0	39.43	0.31	±7.46	2514.
150.0	39.48	0.33	±7.48	2569.
160.0	39.54	0.35	±7.51	2623.
170.0	39.58	0.37	±7.53	2674.
180.0	39.63	0.38	±7.56	2724.
190.0	39.67	0.40	±7.58	2773.
200.0	39.71	0.42	±7.60	2821.
210.0	39.75	0.44	±7.63	2868.
220.0	39.79	0.46	±7.65	2914.
230.0	39.83	0.48	±7.67	2958.
240.0	39.87	0.49	±7.69	3027.
250.0	39.90	0.51	±7.71	3038.
260.0	39.93	0.53	±7.73	3090.
270.0	39.96	0.55	±7.75	3157.
280.0	39.99	0.57	±7.77	3165.
290.0	40.02	0.58	±7.79	3205.
300.0	40.05	0.60	±7.81	3242.
310.0	40.08	0.62	±7.82	3279.
320.0	40.10	0.63	±7.84	3317.
330.0	40.12	0.65	±7.86	3355.
340.0	40.15	0.67	±7.87	3392.
350.0	40.17	0.69	±7.89	3429.
360.0	40.19	0.70	±7.91	3464.
370.0	40.21	0.72	±7.92	3499.
380.0	40.23	0.74	±7.94	3533.
390.0	40.25	0.75	±7.95	3567.
400.0	40.27	0.77	±7.97	3599.
410.0	40.29	0.79	±7.98	3631.
420.0	40.31	0.80	±8.00	3663.
430.0	40.33	0.82	±8.01	3695.
440.0	40.35	0.84	±8.03	3724.
450.0	40.37	0.85	±8.04	3749.
460.0	40.38	0.87	±8.05	3778.
470.0	40.40	0.88	±8.07	3796.
480.0	40.41	0.90	±8.08	3779.
490.0	40.43	0.92	±8.09	3778.
500.0	40.44	0.93	±8.10	3798.
510.0	40.46	0.95	±8.11	3819.
518.7	40.47	0.96	±8.12	0.
				(3836) I MAX

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NO.5 WING W.B.TK. (P/S)

VOLUME (CUB.M)	LCG (METER)	VCG (METER)	TCG (METER)	I (M**4)
0.0	-	1.69	-	-
10.0	33.60	1.94	±14.53	14.
20.0	33.93	2.10	±14.48	16.
30.0	34.00	2.25	±14.51	19.
40.0	34.05	2.39	±14.54	21.
50.0	34.10	2.53	±14.56	22.
60.0	34.13	2.66	±14.58	23.
70.0	34.17	2.79	±14.60	24.
80.0	34.20	2.92	±14.62	25.
90.0	34.24	3.05	±14.63	25.
100.0	34.26	3.18	±14.65	26.
110.0	34.29	3.30	±14.66	26.
120.0	34.31	3.42	±14.66	26.
130.0	34.33	3.55	±14.67	26.
140.0	34.35	3.67	±14.68	26.
150.0	34.36	3.79	±14.68	26.
160.0	34.37	3.91	±14.69	26.
170.0	34.38	4.04	±14.69	26.
180.0	34.39	4.16	±14.69	26.
190.0	34.40	4.28	±14.69	26.
200.0	34.41	4.40	±14.70	26.
210.0	34.41	4.52	±14.70	26.
220.0	34.42	4.64	±14.70	26.
230.0	34.43	4.76	±14.70	26.
240.0	34.43	4.89	±14.71	26.
250.0	34.44	5.01	±14.71	26.
260.0	34.44	5.13	±14.71	26.
270.0	34.44	5.25	±14.71	26.
280.0	34.45	5.37	±14.71	26.
290.0	34.45	5.49	±14.71	26.
300.0	34.45	5.61	±14.72	26.
310.0	34.46	5.73	±14.72	26.
320.0	34.46	5.85	±14.72	26.
330.0	34.46	5.97	±14.72	26.
340.0	34.47	6.09	±14.72	26.
350.0	34.47	6.21	±14.72	26.
360.0	34.47	6.33	±14.72	26.
370.0	34.47	6.45	±14.72	26.
380.0	34.47	6.57	±14.72	26.
390.0	34.48	6.69	±14.72	26.
400.0	34.48	6.82	±14.72	26.
410.0	34.48	6.94	±14.72	26.
420.0	34.48	7.06	±14.72	26.
430.0	34.48	7.18	±14.73	26.
440.0	34.48	7.30	±14.73	26.
450.0	34.49	7.42	±14.73	26.
460.0	34.49	7.54	±14.73	26.
470.0	34.49	7.66	±14.73	26.
480.0	34.49	7.78	±14.73	26.
490.0	34.49	7.90	±14.73	26.
500.0	34.49	8.02	±14.73	26.
510.0	34.49	8.14	±14.73	26.
520.0	34.50	8.26	±14.73	26.
530.0	34.50	8.38	±14.73	26.
540.0	34.50	8.50	±14.73	26.
550.0	34.50	8.62	±14.73	26.
552.8	34.50	8.65	±14.73	0.
				(26) I MAX.

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NO.6 WING W.B.T. (P/S)

VOLUME (CUB.M)	LCG (METER)	VCG (METER)	TCG (METER)	I (M**4)
0.0	-	4.24	-	-
10.0	86.61	5.41	±6.95	28.
20.0	87.11	5.73	±7.27	63.
30.0	87.45	5.95	±7.46	99.
40.0	87.75	6.14	±7.62	135.
50.0	87.99	6.29	±7.74	171.
60.0	88.22	6.42	±7.84	207.
70.0	88.43	6.55	±7.94	243.
80.0	88.61	6.66	±8.02	278.
90.0	88.79	6.76	±8.08	335.
100.0	88.95	6.85	±8.15	344.
110.0	89.10	6.94	±8.20	374.
120.0	89.24	7.03	±8.26	403.
130.0	89.37	7.11	±8.32	431.
140.0	89.49	7.19	±8.37	458.
150.0	89.59	7.26	±8.42	485.
160.0	89.69	7.33	±8.47	511.
170.0	89.78	7.40	±8.52	537.
180.0	89.87	7.46	±8.56	562.
190.0	89.95	7.53	±8.61	587.
200.0	90.02	7.59	±8.65	612.
210.0	90.09	7.65	±8.69	637.
220.0	90.15	7.71	±8.74	661.
230.0	90.22	7.77	±8.77	684.
240.0	90.27	7.83	±8.81	707.
250.0	90.33	7.88	±8.85	729.
260.0	90.38	7.94	±8.89	751.
270.0	90.43	7.99	±8.92	772.
280.0	90.47	8.05	±8.96	793.
(287.6)	(90.50)	(8.06)	(±9.01)	(808) I MAX.
300.0	90.53	8.15	±9.13	76.
310.0	90.56	8.21	±9.25	84.
320.0	90.59	8.27	±9.36	91.
330.0	90.62	8.33	±9.46	97.
340.0	90.64	8.39	±9.56	103.
350.0	90.67	8.45	±9.66	109.
360.0	90.70	8.52	±9.75	114.
370.0	90.73	8.58	±9.83	120.
380.0	90.75	8.65	±9.92	125.
390.0	90.78	8.71	±10.00	130.
400.0	90.81	8.78	±10.07	134.
410.0	90.83	8.85	±10.15	139.
420.0	90.85	8.91	±10.22	143.
430.0	90.88	8.98	±10.29	147.
440.0	90.90	9.05	±10.35	150.
450.0	90.92	9.11	±10.42	154.
460.0	90.94	9.18	±10.50	17.
470.0	90.96	9.26	±10.59	18.
480.0	90.98	9.33	±10.68	19.
490.0	91.00	9.41	±10.76	20.
500.0	91.01	9.49	±10.84	21.
510.0	91.03	9.57	±10.91	22.
520.0	91.05	9.66	±10.99	23.
530.0	91.07	9.74	±11.06	23.
540.0	91.09	9.83	±11.12	23.
550.0	91.10	9.92	±11.19	23.
560.0	91.12	10.01	±11.25	24.
566.0	91.13	10.07	±11.29	0.

19

AFT PEAK TANK (P SIDE)

VOLUME (CUB.M)	LCG (METER)	VCG (METER)	TCG (METER)	I (M**4)
0.0	-	8.50	-	-
10.0	111.90	9.75	-2.00	100.
20.0	112.45	10.01	-2.59	236.
30.0	112.87	10.18	-2.93	369.
40.0	113.22	10.31	-3.17	498.
50.0	113.51	10.41	-3.34	624.
60.0	113.76	10.50	-3.50	796.
70.0	113.98	10.56	-3.64	832.
80.0	114.18	10.65	-3.76	940.
90.0	114.36	10.72	-3.88	1024.
100.0	114.53	10.79	-3.98	1085.
110.0	114.70	10.84	-4.07	1190.
120.0	114.85	10.90	-4.15	1260.
130.0	115.00	10.95	-4.23	1350.
140.0	115.14	11.00	-4.30	1439.
150.0	115.26	11.05	-4.38	1527.
160.0	115.38	11.10	-4.44	1614.
170.0	115.50	11.15	-4.51	1698.
180.0	115.61	11.19	-4.57	1776.
190.0	115.71	11.23	-4.63	1856.
200.0	115.81	11.27	-4.69	1939.
210.0	115.90	11.31	-4.75	2025.
220.0	116.03	11.35	-4.80	1615.
230.0	116.19	11.39	-4.84	1621.
240.0	116.34	11.43	-4.89	1700.
250.0	116.48	11.47	-4.93	1790.
260.0	116.61	11.51	-4.98	1873.
270.0	116.74	11.54	-5.02	1950.
280.0	116.86	11.58	-5.06	2138.
290.0	116.98	11.62	-5.10	2137.
300.0	117.09	11.65	-5.14	2175.
310.0	117.19	11.69	-5.18	2244.
320.0	117.29	11.72	-5.22	2311.
330.0	117.38	11.76	-5.26	2376.
340.0	117.47	11.79	-5.30	2440.
350.0	117.55	11.83	-5.34	2502.
360.0	117.63	11.86	-5.37	2562.
370.0	117.71	11.89	-5.41	2620.
380.0	117.78	11.93	-5.45	2677.
390.0	117.85	11.96	-5.48	2788.
400.0	117.92	11.99	-5.52	2787.
410.0	117.98	12.02	-5.55	2797.
420.0	118.04	12.05	-5.58	2819.
430.0	118.10	12.09	-5.61	2852.
440.0	118.15	12.12	-5.64	2897.
442.3	118.16	12.12	-5.65	0.
				(2909) I MAX.

1123

AFT PEAK TANK (S SIDE)

VOLUME (CUB.M)	LCG (METER)	VCG (METER)	TCG (METER)	I (M**4)
0.0	-	8.50	-	-
10.0	111.90	9.75	2.00	100.
20.0	112.45	10.01	2.59	236.
30.0	112.87	10.18	2.93	369.
40.0	113.22	10.31	3.17	498.
50.0	113.51	10.41	3.34	624.
60.0	113.76	10.50	3.50	778.
70.0	113.99	10.58	3.64	832.
80.0	114.19	10.65	3.76	1034.
90.0	114.39	10.72	3.87	1052.
100.0	114.58	10.79	3.96	1109.
110.0	114.76	10.84	4.05	1236.
120.0	114.92	10.90	4.12	1299.
130.0	115.08	10.95	4.20	1391.
140.0	115.22	11.00	4.27	1484.
150.0	115.35	11.05	4.34	1578.
160.0	115.47	11.10	4.40	1672.
170.0	115.59	11.14	4.46	1764.
180.0	115.70	11.18	4.52	1855.
190.0	115.81	11.23	4.58	1946.
200.0	115.91	11.27	4.63	2036.
210.0	116.00	11.31	4.69	2127.
220.0	116.12	11.35	4.73	1748.
230.0	116.27	11.38	4.77	1741.
240.0	116.42	11.42	4.81	1789.
250.0	116.56	11.46	4.85	1879.
260.0	116.70	11.50	4.89	1964.
270.0	116.83	11.53	4.93	2043.
280.0	116.95	11.57	4.97	2117.
290.0	117.06	11.60	5.01	2269.
300.0	117.17	11.64	5.05	2278.
310.0	117.28	11.67	5.09	2339.
320.0	117.37	11.71	5.12	2407.
330.0	117.47	11.74	5.16	2472.
340.0	117.56	11.78	5.20	2536.
350.0	117.64	11.81	5.23	2598.
360.0	117.72	11.84	5.27	2659.
370.0	117.80	11.88	5.30	2717.
380.0	117.87	11.91	5.34	2775.
390.0	117.94	11.94	5.37	2830.
400.0	118.00	11.97	5.41	2922.
410.0	118.07	12.00	5.44	2923.
420.0	118.13	12.03	5.47	2935.
430.0	118.18	12.07	5.50	2958.
440.0	118.24	12.10	5.53	2991.
450.0	118.29	12.13	5.56	3035.
450.7	118.29	12.13	5.56	0.
				(3039) I MAX.

ANTI-HEELING T. (P/S)

VOLUME (CUB.M)	LCG (METER)	VCG (METER)	TCG (METER)	I (M**4)
0.0	-	1.56	-	-
20.0	49.11	2.00	±12.27	57.
40.0	49.16	2.21	±12.39	75.
60.0	49.23	2.39	±12.48	92.
80.0	49.30	2.57	±12.56	107.
100.0	49.36	2.73	±12.63	120.
120.0	49.41	2.89	±12.69	133.
140.0	49.45	3.05	±12.74	144.
(160.9)	(49.49)	(3.21)	(±12.79)	(154) I MAX.
180.0	49.50	3.36	±12.98	18.
200.0	49.51	3.55	±13.15	21.
220.0	49.54	3.75	±13.29	23.
240.0	49.57	3.96	±13.40	24.
260.0	49.60	4.17	±13.51	25.
280.0	49.63	4.39	±13.60	25.
300.0	49.65	4.61	±13.67	25.
320.0	49.67	4.84	±13.74	25.
340.0	49.70	5.06	±13.80	25.
360.0	49.71	5.29	±13.85	25.
380.0	49.73	5.52	±13.90	25.
400.0	49.74	5.75	±13.94	25.
420.0	49.76	5.99	±13.98	25.
440.0	49.77	6.22	±14.01	25.
460.0	49.78	6.46	±14.05	25.
480.0	49.79	6.69	±14.08	25.
500.0	49.80	6.93	±14.10	25.
520.0	49.81	7.16	±14.13	25.
540.0	49.82	7.40	±14.15	25.
560.0	49.82	7.64	±14.17	25.
580.0	49.83	7.88	±14.19	25.
600.0	49.83	8.11	±14.21	25.
600.9	49.83	8.13	±14.21	0.

NO.1 P.W.T. (P/S)

VOLUME (CUB.M)	LCG (METER)	VCG (METER)	TCG (METER)	I (M**4)
0.0	-	15.31	-	-
5.0	-96.05	15.48	±9.47	11.
10.0	-96.14	15.63	±9.55	15.
15.0	-96.21	15.76	±9.62	20.
20.0	-96.26	15.88	±9.68	26.
25.0	-96.30	16.00	±9.75	31.
30.0	-96.34	16.11	±9.81	37.
35.0	-96.37	16.21	±9.87	44.
40.0	-96.40	16.31	±9.93	51.
45.0	-96.42	16.40	±9.98	57.
50.0	-96.45	16.49	±10.04	65.
55.0	-96.47	16.57	±10.09	73.
60.0	-96.48	16.65	±10.14	82.
65.0	-96.50	16.73	±10.19	91.
70.0	-96.52	16.81	±10.24	100.
75.0	-96.53	16.88	±10.29	109.
80.0	-96.54	16.96	±10.34	119.
85.0	-96.55	17.03	±10.39	130.
90.0	-96.57	17.10	±10.43	141.
95.0	-96.58	17.16	±10.48	152.
100.0	-96.59	17.23	±10.52	164.
105.0	-96.59	17.29	±10.56	178.
(110.0)	(-96.60)	(17.36)	(±10.61)	(219) I MAX.
115.0	-96.61	17.42	±10.65	144.
116.5	-96.62	17.44	±10.64	0.

NO.2 P.W.TK.

VOLUME (CUB.M)	LCG (METER)	VCG (METER)	TCG (METER)	I (M**4)
0.0	-	11.71	-	-
2.0	74.10	11.80	12.87	2.
4.0	74.10	11.88	14.07	2.
6.0	74.10	11.97	14.07	2.
8.0	74.10	12.05	14.07	2.
10.0	74.10	12.13	14.12	10.
12.0	74.10	12.20	14.22	14.
14.0	74.10	12.27	14.30	14.
16.0	74.10	12.33	14.35	14.
18.0	74.10	12.38	14.40	14.
20.0	74.10	12.43	14.43	14.
22.0	74.10	12.48	14.46	14.
24.0	74.10	12.53	14.49	14.
26.0	74.10	12.58	14.51	14.
28.0	74.09	12.63	14.52	14.
30.0	74.09	12.68	14.54	14.
32.0	74.08	12.72	14.55	14.
34.0	74.08	12.77	14.56	14.
36.0	74.08	12.82	14.57	14.
38.0	74.07	12.86	14.58	14.
40.0	74.07	12.91	14.58	14.
42.0	74.07	12.95	14.59	14.
44.0	74.07	13.00	14.60	14.
46.0	74.07	13.04	14.61	14.
48.0	74.07	13.09	14.61	14.
50.0	74.08	13.13	14.62	14.
52.0	74.08	13.17	14.62	14.
54.0	74.08	13.22	14.63	14.
(56.0)	(74.06)	(13.26)	(14.63)	(14) I MAX.
58.0	74.01	13.31	14.64	8.
60.0	73.95	13.35	14.64	8.
62.0	73.89	13.40	14.64	8.
64.0	73.83	13.45	14.65	8.
66.0	73.78	13.51	14.65	8.
66.0	73.73	13.56	14.65	8.
70.0	73.68	13.62	14.66	8.
72.0	73.64	13.67	14.66	8.
74.0	73.60	13.73	14.66	8.
76.0	73.56	13.79	14.66	8.
78.0	73.52	13.85	14.66	8.
80.0	73.48	13.91	14.67	8.
82.0	73.45	13.97	14.67	8.
84.0	73.42	14.04	14.67	8.
86.0	73.39	14.10	14.67	8.
88.0	73.36	14.16	14.67	8.
90.0	73.33	14.23	14.68	8.
92.0	73.30	14.29	14.68	8.
94.0	73.28	14.36	14.68	8.
96.0	73.25	14.42	14.68	8.
98.0	73.23	14.49	14.68	8.
100.0	73.21	14.56	14.68	8.
102.0	73.19	14.63	14.68	8.
104.0	73.16	14.69	14.69	8.
106.0	73.14	14.76	14.69	8.
108.0	73.12	14.83	14.69	8.
110.0	73.11	14.90	14.69	8.
111.4	73.09	14.95	14.69	0.

DIST.WATER TK.

VOLUME (CUB.M)	LCG (METER)	VCG (METER)	TCG (METER)	I (M**4)
0.0	-	11.71	-	-
2.0	80.10	11.83	-14.73	5.
4.0	80.10	11.95	-14.73	5.
6.0	80.10	12.07	-14.73	5.
8.0	80.10	12.18	-14.74	5.
10.0	80.10	12.30	-14.74	5.
12.0	80.10	12.42	-14.74	5.
14.0	80.10	12.54	-14.74	5.
16.0	80.10	12.65	-14.74	5.
18.0	80.10	12.77	-14.74	5.
20.0	80.10	12.89	-14.74	5.
22.0	80.10	13.01	-14.74	5.
24.0	80.10	13.12	-14.75	5.
26.0	80.10	13.24	-14.75	5.
28.0	80.10	13.36	-14.75	5.
30.0	80.10	13.47	-14.75	5.
30.6	80.10	13.51	-14.75	0.
				(5) I MAX.

COOL.W.TK.

VOLUME (CUB.M)	LCG (METER)	VCG (METER)	TCG (METER)	I (M**4)
0.0	-	0.0	-	-
2.0	109.28	0.25	0.0	0.
4.0	109.27	0.46	0.0	1.
6.0	109.27	0.63	0.0	1.
8.0	109.26	0.79	0.0	1.
10.0	109.26	0.94	0.0	2.
12.0	109.26	1.08	0.0	2.
14.0	109.26	1.21	0.0	3.
16.0	109.26	1.33	0.0	3.
18.0	109.27	1.45	0.0	4.
20.0	109.29	1.56	0.0	4.
22.0	109.31	1.67	0.0	4.
24.0	109.32	1.78	0.0	4.
26.0	109.34	1.88	0.0	5.
28.0	109.36	1.98	0.0	6.
30.0	109.39	2.08	0.0	8.
32.0	109.41	2.17	0.0	9.
34.0	109.42	2.26	0.0	10.
36.0	109.44	2.35	0.0	11.
38.0	109.45	2.43	0.0	11.
(40.0)	(109.46)	(2.52)	(0.0)	(11) I MAX.
42.0	109.47	2.61	0.0	10.
44.0	109.49	2.70	0.0	9.
46.0	109.51	2.78	0.0	8.
48.0	109.53	2.87	0.0	7.
50.0	109.54	2.95	0.0	6.
52.0	109.55	3.03	0.0	6.
54.0	109.55	3.11	0.0	5.
56.0	109.55	3.19	0.0	5.
58.0	109.54	3.28	0.0	5.
60.0	109.54	3.36	0.0	5.
62.0	109.54	3.44	0.0	5.
64.0	109.53	3.52	0.0	5.
66.0	109.52	3.60	0.0	5.
68.0	109.52	3.68	0.0	5.
70.0	109.51	3.76	0.0	5.
72.0	109.50	3.84	0.0	5.
74.0	109.49	3.92	0.0	5.
76.0	109.48	4.01	0.0	5.
78.0	109.47	4.09	0.0	5.
80.0	109.46	4.17	0.0	5.
82.0	109.45	4.25	0.0	5.
84.0	109.44	4.34	0.0	5.
86.0	109.43	4.42	0.0	4.
88.0	109.43	4.50	0.0	4.
90.0	109.45	4.59	0.0	2.
90.1	109.45	4.60	0.0	0.

NO.3 F.WING F.O.TK. (P/S)

VOLUME (CUB.M)	LCG (METER)	VCG (METER)	TCG (METER)	I (M**4)
0.0	-	1.56	-	-
10.0	-25.72	1.91	±11.13	32.
20.0	-25.75	2.06	±11.28	36.
30.0	-25.78	2.21	±11.43	37.
40.0	-25.81	2.36	±11.59	38.
(55.5)	(-25.84)	(2.57)	(±11.82)	(38) I MAX.
60.0	-25.85	2.64	±11.89	37.
70.0	-25.88	2.77	±12.03	35.
80.0	-25.90	2.91	±12.16	33.
90.0	-25.92	3.05	±12.30	31.
100.0	-25.94	3.19	±12.43	28.
110.0	-25.96	3.33	±12.55	25.
120.0	-25.97	3.47	±12.68	21.
130.0	-25.96	3.62	±12.80	18.
140.0	-25.95	3.77	±12.91	16.
150.0	-25.93	3.91	±13.01	16.
160.0	-25.90	4.07	±13.11	17.
170.0	-25.88	4.22	±13.20	19.
180.0	-25.86	4.37	±13.28	19.
190.0	-25.84	4.52	±13.36	20.
200.0	-25.83	4.67	±13.43	20.
210.0	-25.82	4.82	±13.49	21.
220.0	-25.81	4.97	±13.55	21.
230.0	-25.81	5.12	±13.60	21.
240.0	-25.80	5.27	±13.65	22.
250.0	-25.80	5.42	±13.69	22.
260.0	-25.80	5.57	±13.73	22.
270.0	-25.80	5.71	±13.77	22.
280.0	-25.79	5.86	±13.80	22.
290.0	-25.79	6.01	±13.84	22.
300.0	-25.79	6.15	±13.87	22.
310.0	-25.79	6.30	±13.89	22.
320.0	-25.78	6.45	±13.92	22.
330.0	-25.78	6.59	±13.95	22.
340.0	-25.78	6.74	±13.97	22.
350.0	-25.77	6.88	±13.99	22.
360.0	-25.77	7.03	±14.01	22.
370.0	-25.77	7.17	±14.03	22.
380.0	-25.77	7.32	±14.05	22.
390.0	-25.77	7.46	±14.07	22.
400.0	-25.77	7.61	±14.09	22.
410.0	-25.77	7.75	±14.10	22.
420.0	-25.77	7.90	±14.12	22.
430.0	-25.77	8.04	±14.13	22.
440.0	-25.77	8.19	±14.15	22.
450.0	-25.77	8.33	±14.16	22.
460.0	-25.76	8.47	±14.17	22.
466.7	-25.76	8.57	±14.18	0.
		98% OF VOLUME WITH 5° HEEL		22

NO.3 A.WING F.O.TK. (P/S)

VOLUME (CUB.M)	LCG (METER)	VCG (METER)	TCG (METER)	I (M**4)
0.0	-	1.69	-	-
10.0	-11.85	1.93	±13.37	23.
20.0	-11.40	2.10	±13.50	21.
30.0	-11.30	2.25	±13.64	20.
40.0	-11.22	2.41	±13.76	19.
50.0	-11.14	2.56	±13.87	19.
60.0	-11.08	2.70	±13.96	19.
70.0	-11.02	2.85	±14.03	19.
80.0	-10.96	2.99	±14.10	20.
90.0	-10.93	3.12	±14.16	23.
100.0	-10.90	3.26	±14.21	23.
110.0	-10.88	3.39	±14.25	24.
120.0	-10.87	3.52	±14.29	25.
130.0	-10.87	3.65	±14.32	25.
140.0	-10.87	3.78	±14.35	26.
150.0	-10.87	3.90	±14.38	26.
160.0	-10.87	4.03	±14.40	27.
170.0	-10.88	4.15	±14.42	27.
180.0	-10.88	4.27	±14.44	27.
190.0	-10.88	4.39	±14.46	27.
200.0	-10.89	4.51	±14.47	27.
210.0	-10.89	4.63	±14.48	27.
220.0	-10.90	4.75	±14.50	27.
230.0	-10.90	4.87	±14.51	27.
240.0	-10.90	4.99	±14.52	27.
250.0	-10.90	5.10	±14.53	27.
260.0	-10.91	5.22	±14.53	27.
270.0	-10.91	5.34	±14.54	27.
280.0	-10.91	5.46	±14.55	27.
290.0	-10.91	5.57	±14.56	27.
300.0	-10.91	5.69	±14.56	27.
310.0	-10.91	5.81	±14.57	27.
320.0	-10.92	5.92	±14.57	27.
330.0	-10.92	6.04	±14.58	27.
340.0	-10.92	6.16	±14.59	27.
350.0	-10.92	6.27	±14.59	27.
360.0	-10.92	6.39	±14.59	27.
370.0	-10.92	6.50	±14.60	27.
380.0	-10.92	6.62	±14.60	27.
390.0	-10.92	6.74	±14.61	27.
400.0	-10.92	6.85	±14.61	27.
410.0	-10.93	6.97	±14.61	27.
420.0	-10.93	7.08	±14.62	27.
430.0	-10.93	7.20	±14.62	27.
440.0	-10.93	7.31	±14.62	27.
450.0	-10.93	7.43	±14.63	27.
460.0	-10.93	7.54	±14.63	27.
470.0	-10.93	7.66	±14.63	27.
480.0	-10.93	7.77	±14.63	27.
490.0	-10.93	7.89	±14.64	27.
500.0	-10.93	8.00	±14.64	27.
510.0	-10.93	8.12	±14.64	27.
520.0	-10.93	8.23	±14.64	27.
530.0	-10.93	8.35	±14.64	27.
540.0	-10.93	8.46	±14.65	27.
550.0	-10.94	8.58	±14.65	27.
560.0	-10.94	8.69	±14.65	27.
567.8	-10.94	8.78	±14.65	0.
				(27) I MAX.
		98% OF VOLUME WITH 5° HEEL		27

DEEP F.O.TK. (P.SIDE)

	VOLUME (CUB.M)	LCG (METER)	VCG (METER)	TCG (METER)	I (M**4)
	0.0	-	0.32	-	-
	10.0	60.26	1.13	-7.13	31.
	20.0	60.34	1.45	-7.66	67.
	30.0	60.37	1.70	-8.02	100.
	40.0	60.39	1.92	-8.28	131.
	50.0	60.41	2.12	-8.50	158.
	60.0	60.42	2.31	-8.68	186.
	70.0	60.43	2.49	-8.84	215.
	80.0	60.45	2.66	-8.99	249.
	90.0	60.48	2.82	-9.13	283.
	100.0	60.52	2.98	-9.27	314.
	110.0	60.57	3.13	-9.40	343.
	120.0	60.62	3.28	-9.52	367.
	130.0	60.67	3.42	-9.63	389.
	140.0	60.72	3.55	-9.73	409.
	150.0	60.77	3.68	-9.83	427.
	160.0	60.82	3.81	-9.92	444.
	170.0	60.86	3.93	-10.01	459.
	180.0	60.91	4.05	-10.09	473.
	190.0	60.95	4.17	-10.16	486.
	200.0	60.98	4.29	-10.23	497.
	210.0	61.02	4.40	-10.30	508.
	220.0	61.05	4.52	-10.36	517.
	230.0	61.09	4.63	-10.42	526.
	240.0	61.12	4.74	-10.47	534.
	250.0	61.15	4.84	-10.53	541.
	260.0	61.18	4.95	-10.58	548.
	270.0	61.20	5.05	-10.62	554.
	(278.0)	(61.22)	(5.14)	(-10.66)	(559) I MAX.
	290.0	61.32	5.26	-10.83	15.
	300.0	61.40	5.38	-10.95	16.
	310.0	61.47	5.49	-11.08	17.
	320.0	61.54	5.62	-11.19	17.
	330.0	61.60	5.74	-11.30	17.
	340.0	61.67	5.87	-11.40	17.
	350.0	61.72	6.00	-11.50	17.
	360.0	61.78	6.13	-11.59	17.
	370.0	61.83	6.27	-11.67	17.
	380.0	61.88	6.41	-11.75	12.
	390.0	61.89	6.55	-11.83	12.
	400.0	61.89	6.70	-11.90	12.
	410.0	61.90	6.85	-11.97	12.
	420.0	61.90	7.01	-12.04	12.
	430.0	61.91	7.18	-12.10	12.
	440.0	61.91	7.34	-12.16	12.
	450.0	61.92	7.51	-12.22	5.
	460.0	61.97	7.70	-12.27	5.
OVERFLOW	468.9	62.01	7.88	-12.32	5.
	470.0	62.01	7.91	-12.33	5.
	478.5	62.05	8.09	-12.37	0.

98% OF VOLUME WITH 5° HEEL 5

DEEP F.O.TK. (S.SIDE)

	VOLUME (CUB.M)	LCG (METER)	VCG (METER)	TCG (METER)	I (M**4)
	0.0	-	0.32	-	-
	10.0	60.25	1.13	7.14	31.
	20.0	60.33	1.44	7.66	66.
	30.0	60.37	1.70	8.02	100.
	40.0	60.39	1.92	8.28	131.
	50.0	60.40	2.12	8.50	158.
	60.0	60.41	2.31	8.68	186.
	70.0	60.43	2.49	8.84	215.
	80.0	60.44	2.66	8.99	249.
	90.0	60.47	2.82	9.13	282.
	100.0	60.52	2.98	9.27	314.
	110.0	60.56	3.13	9.39	343.
	120.0	60.62	3.27	9.51	368.
	130.0	60.67	3.41	9.63	390.
	140.0	60.72	3.55	9.73	410.
	150.0	60.77	3.68	9.83	428.
	160.0	60.82	3.81	9.92	445.
	170.0	60.86	3.93	10.01	460.
	180.0	60.91	4.05	10.09	473.
	190.0	60.95	4.17	10.16	486.
	200.0	60.99	4.29	10.23	498.
	210.0	61.02	4.40	10.30	509.
	220.0	61.06	4.51	10.36	519.
	230.0	61.09	4.62	10.42	528.
	240.0	61.12	4.73	10.48	536.
	250.0	61.15	4.84	10.53	543.
	260.0	61.18	4.94	10.58	550.
	270.0	61.21	5.05	10.63	556.
	(278.4)	(61.23)	(5.14)	(10.66)	(561) I MAX.
	290.0	61.32	5.26	10.82	15.
	300.0	61.40	5.37	10.95	16.
	310.0	61.47	5.49	11.08	17.
	320.0	61.54	5.61	11.19	17.
	330.0	61.61	5.73	11.30	17.
	340.0	61.67	5.86	11.40	11.
	350.0	61.79	5.99	11.49	11.
	360.0	61.90	6.14	11.59	11.
	370.0	62.00	6.29	11.67	11.
	380.0	62.10	6.45	11.75	11.
	390.0	62.19	6.61	11.83	11.
	400.0	62.28	6.78	11.90	11.
	410.0	62.36	6.96	11.97	11.
	420.0	62.44	7.14	12.04	11.
	430.0	62.52	7.33	12.10	11.
	440.0	62.59	7.53	12.16	11.
	450.0	62.66	7.72	12.22	11.
	460.0	62.72	7.92	12.27	11.
	470.0	62.79	8.13	12.33	11.
OVERFLOW	476.5	62.83	8.26	12.36	11.
	480.0	62.85	8.34	12.38	11.
	486.2	62.88	8.47	12.41	0.

98% OF VOLUME WITH 5° HEEL 11

H.F.O.SETT.TK. (P.SIDE)

	VOLUME (CUB.M)	LCG (METER)	VCG (METER)	TCG (METER)	I (M**4)
	0.0	-	8.02	-	-
	5.0	61.84	8.37	-9.49	95.
	10.0	61.35	8.55	-9.49	159.
	15.0	61.08	8.66	-9.49	159.
	20.0	60.93	8.76	-9.49	159.
	25.0	60.84	8.85	-9.49	159.
	30.0	60.78	8.94	-9.49	159.
	35.0	60.74	9.03	-9.49	159.
	40.0	60.71	9.11	-9.49	159.
	45.0	60.69	9.20	-9.49	159.
	50.0	60.67	9.28	-9.49	159.
	55.0	60.66	9.36	-9.49	159.
	60.0	60.64	9.44	-9.49	159.
	65.0	60.63	9.53	-9.49	159.
	70.0	60.62	9.61	-9.49	159.
	75.0	60.61	9.69	-9.49	159.
	80.0	60.61	9.77	-9.49	159.
	85.0	60.60	9.85	-9.49	159.
	90.0	60.60	9.94	-9.49	159.
	95.0	60.59	10.02	-9.49	159.
	100.0	60.59	10.10	-9.49	159.
	105.0	60.58	10.18	-9.49	159.
	110.0	60.58	10.26	-9.49	159.
	115.0	60.57	10.34	-9.49	159.
OVERFLOW	118.2	60.57	10.40	-9.49	159.
	120.0	60.57	10.42	-9.49	159.
	125.0	60.57	10.50	-9.49	159.
	130.0	60.57	10.58	-9.49	159.
	135.0	60.56	10.67	-9.49	159.
	140.0	60.56	10.75	-9.49	159.
	145.0	60.56	10.83	-9.49	159.
	150.0	60.56	10.91	-9.49	159.
	155.0	60.56	10.99	-9.49	159.
	160.0	60.55	11.07	-9.49	159.
	165.0	60.55	11.15	-9.49	159.
	170.0	60.55	11.23	-9.49	159.
	175.0	60.55	11.31	-9.49	159.
	180.0	60.55	11.39	-9.49	159.
	185.0	60.55	11.48	-9.49	159.
	185.6	60.55	11.49	-9.49	0.
					(159) I MAX.

98% OF VOLUME WITH 5° HEEL 159

H.F.O.SETT.TK. (S.SIDE)

	VOLUME (CUB.M)	LCG (METER)	VCG (METER)	TCG (METER)	I (M**4)
	0.0	-	8.02	-	-
	5.0	61.29	8.57	11.62	15.
	10.0	60.89	8.80	11.62	15.
	15.0	60.76	8.99	11.62	15.
	20.0	60.70	9.16	11.62	15.
	25.0	60.66	9.36	11.65	82.
	30.0	60.63	9.52	11.87	82.
	35.0	60.61	9.67	12.03	82.
	40.0	60.60	9.81	12.15	82.
	45.0	60.59	9.93	12.24	82.
	50.0	60.58	10.05	12.31	82.
	55.0	60.57	10.17	12.37	82.
	60.0	60.56	10.29	12.42	82.
	65.0	60.56	10.40	12.46	82.
	70.0	60.56	10.51	12.50	82.
	75.0	60.55	10.62	12.53	82.
	80.0	60.55	10.73	12.56	82.
	85.0	60.55	10.84	12.58	82.
	90.0	60.54	10.95	12.60	82.
	95.0	60.54	11.05	12.62	82.
	100.0	60.54	11.16	12.64	82.
	105.0	60.54	11.26	12.66	82.
	110.0	60.54	11.37	12.67	82.
	115.0	60.53	11.47	12.68	82.
OVERFLOW	117.4	60.53	11.52	12.69	82.
	120.0	60.53	11.58	12.69	82.
	125.0	60.53	11.68	12.71	82.
	130.0	60.53	11.78	12.72	82.
	130.2	60.53	11.79	12.72	0.
					(82) I MAX

98% OF VOLUME WITH 5° HEEL 82

H.F.O.SERV.TK.

VOLUME (CUB.M)	LCG (METER)	VCG (METER)	TCG (METER)	I (M**4)
0.0	-	8.02	-	-
5.0	61.43	8.53	7.71	25.
10.0	60.97	8.73	7.71	26.
15.0	60.81	8.90	7.71	26.
20.0	60.73	9.06	7.71	26.
25.0	60.69	9.21	7.71	26.
30.0	60.66	9.36	7.71	26.
35.0	60.63	9.52	7.71	26.
40.0	60.62	9.67	7.71	26.
45.0	60.60	9.82	7.71	26.
50.0	60.59	9.97	7.71	26.
55.0	60.58	10.11	7.71	26.
60.0	60.58	10.26	7.71	26.
65.0	60.57	10.41	7.71	26.
70.0	60.57	10.56	7.71	26.
75.0	60.56	10.71	7.71	26.
80.0	60.56	10.86	7.71	26.
85.0	60.55	11.01	7.71	26.
90.0	60.55	11.16	7.71	26.
95.0	60.55	11.31	7.71	26.
(101.0)	(60.55)	(11.49)	(7.71)	(26) I MAX
105.0	60.56	11.60	7.71	21.
110.0	60.57	11.76	7.71	21.
115.0	60.59	11.91	7.71	21.
120.0	60.60	12.07	7.71	21.
OVERFLOW 121.7	60.61	12.12	7.71	21.
125.0	60.61	12.23	7.71	21.
130.0	60.62	12.39	7.71	21.
135.0	60.63	12.56	7.71	21.
140.0	60.64	12.72	7.71	21.
144.7	60.65	12.88	7.71	0.

98% OF VOLUME WITH 5° HEEL 21

F.O.DRAIN TK.

VOLUME (CUB.M)	LCG (METER)	VCG (METER)	TCG (METER)	I (M**4)
0.0	-	0.0	-	-
2.0	60.36	0.05	0.0	138.
4.0	60.35	0.10	0.0	192.
6.0	60.33	0.14	0.0	247.
8.0	60.32	0.19	0.0	296.
10.0	60.31	0.22	0.0	331.
12.0	60.30	0.26	0.0	349.
14.0	60.30	0.30	0.0	355.
16.0	60.30	0.33	0.0	356.
18.0	60.30	0.37	0.0	356.
20.0	60.30	0.40	0.0	356.
22.0	60.29	0.44	0.0	356.
(24.4)	(60.29)	(0.48)	(0.0)	(356) I MAX.
26.0	60.30	0.50	0.0	248.
28.0	60.31	0.54	0.0	248.
30.0	60.31	0.57	0.0	248.
32.0	60.31	0.61	0.0	248.
34.0	60.32	0.65	0.0	248.
36.0	60.32	0.68	0.0	248.
38.0	60.32	0.72	0.0	248.
40.0	60.33	0.75	0.0	248.
42.0	60.33	0.79	0.0	248.
44.0	60.33	0.83	0.0	248.
46.0	60.33	0.86	0.0	248.
48.0	60.34	0.90	0.0	248.
50.0	60.35	0.94	0.0	171.
52.0	60.37	0.98	0.0	148.
54.0	60.39	1.02	0.0	118.
56.0	60.42	1.06	0.0	61.
56.5	60.43	1.07	0.0	0.

98% OF VOLUME WITH 5° HEEL 118

H.F.O.SLUDGE TK.

VOLUME (CUB.M)	LCG (METER)	VCG (METER)	TCG (METER)	I (M**4)
0.0	-	6.90	-	-
1.0	61.70	7.03	1.85	2.
OVERFLOW 1.7	61.70	7.13	1.85	2.
2.0	61.70	7.17	1.85	2.
3.0	61.70	7.30	1.85	2.
4.0	61.70	7.43	1.85	2.
4.1	61.70	7.45	1.85	0.
				(2) I MAX.

98% OF VOLUME WITH 5° HEEL 2

DIESEL OIL TK. (S.SIDE)

VOLUME (CUB.M)	LCG (METER)	VCG (METER)	TCG (METER)	I (M**4)
0.0	-	0.0	-	-
2.0	64.81	0.13	2.78	10.
4.0	65.49	0.20	2.95	14.
6.0	65.91	0.26	3.05	17.
8.0	66.26	0.32	3.12	20.
10.0	66.56	0.36	3.18	23.
12.0	66.79	0.41	3.23	26.
14.0	66.99	0.45	3.28	29.
16.0	67.16	0.49	3.32	31.
18.0	67.30	0.52	3.35	34.
20.0	67.43	0.56	3.38	37.
22.0	67.54	0.59	3.41	40.
24.0	67.64	0.62	3.44	42.
26.0	67.73	0.65	3.47	45.
28.0	67.81	0.69	3.49	47.
30.0	67.89	0.71	3.51	47.
32.0	67.97	0.74	3.54	48.
34.0	68.03	0.77	3.55	49.
36.0	68.10	0.80	3.57	50.
38.0	68.16	0.83	3.59	51.
40.0	68.23	0.85	3.60	51.
42.0	68.28	0.88	3.62	52.
44.0	68.34	0.90	3.63	53.
46.0	68.39	0.93	3.64	54.
48.0	68.44	0.95	3.66	55.
50.0	68.49	0.98	3.67	56.
52.0	68.54	1.00	3.68	58.
54.0	68.58	1.03	3.69	59.
56.0	68.63	1.05	3.70	61.
58.0	68.67	1.07	3.72	63.
60.0	68.71	1.10	3.73	65.
62.0	68.75	1.12	3.74	67.
64.0	68.79	1.14	3.75	70.
66.0	68.83	1.16	3.76	72.
68.0	68.87	1.18	3.77	75.
70.0	68.90	1.21	3.78	78.
72.0	68.94	1.23	3.79	81.
74.0	68.97	1.25	3.80	85.
76.0	69.01	1.27	3.81	89.
78.0	69.04	1.29	3.83	93.
80.0	69.07	1.31	3.84	100.
82.0	69.11	1.33	3.85	104.
(83.9)	(69.14)	(1.35)	(3.86)	(107) I MAX.
86.0	69.17	1.37	3.87	106.
88.0	69.20	1.39	3.88	105.
90.0	69.22	1.41	3.89	104.
92.0	69.25	1.43	3.90	103.
94.0	69.27	1.45	3.91	102.
96.0	69.30	1.47	3.92	100.
98.0	69.32	1.49	3.93	99.
100.0	69.34	1.51	3.93	97.
101.0	69.36	1.52	3.94	0.

98% OF VOLUME WITH 5° HEEL 99

DIESEL OIL TK. (P.SIDE)

	VOLUME (CUB.M)	LCG (METER)	VCG (METER)	TCG (METER)	I (M**4)
	0.0	-	0.0	-	-
	2.0	64.64	0.13	-2.77	11.
	4.0	65.05	0.21	-2.96	14.
	6.0	65.25	0.27	-3.08	18.
	8.0	65.37	0.33	-3.17	21.
	10.0	65.46	0.39	-3.25	24.
	12.0	65.52	0.44	-3.31	27.
	14.0	65.57	0.48	-3.37	30.
	16.0	65.62	0.53	-3.43	35.
	18.0	65.65	0.57	-3.48	40.
	20.0	65.69	0.61	-3.53	45.
	22.0	65.71	0.65	-3.58	51.
	24.0	65.73	0.69	-3.63	63.
	26.0	65.76	0.73	-3.67	66.
	28.0	65.80	0.76	-3.69	42.
	30.0	65.83	0.80	-3.71	42.
	32.0	65.86	0.83	-3.73	57.
	34.0	65.89	0.87	-3.76	72.
	36.0	65.92	0.90	-3.80	86.
	38.0	65.94	0.93	-3.84	99.
	40.0	65.96	0.96	-3.87	113.
	42.0	65.98	0.99	-3.91	126.
	44.0	66.00	1.02	-3.95	140.
	46.0	66.02	1.05	-3.99	154.
	48.0	66.03	1.08	-4.03	167.
	50.0	66.05	1.11	-4.07	180.
	52.0	66.07	1.14	-4.12	193.
	54.0	66.08	1.17	-4.16	207.
	56.0	66.10	1.19	-4.20	221.
	58.0	66.11	1.22	-4.24	235.
	60.0	66.12	1.25	-4.28	249.
	62.0	66.14	1.27	-4.31	264.
	64.0	66.15	1.30	-4.35	277.
	66.0	66.16	1.32	-4.39	290.
	68.0	66.18	1.35	-4.43	301.
	(70.5)	(66.19)	(1.38)	(-4.48)	(307) I MAX.
	72.0	66.20	1.39	-4.50	303.
	74.0	66.22	1.42	-4.54	299.
	76.0	66.23	1.44	-4.57	294.
	78.0	66.24	1.46	-4.59	289.
	80.0	66.25	1.48	-4.62	284.
	82.0	66.26	1.50	-4.65	279.
	84.0	66.27	1.53	-4.67	274.
	86.0	66.28	1.55	-4.69	270.
	86.7	66.28	1.56	-4.70	0.

98% OF VOLUME WITH 5° HEEL 274

D.O.SETT.TK.

	VOLUME (CUB.M)	LCG (METER)	VCG (METER)	TCG (METER)	I (M**4)
	0.0	-	11.71	-	-
	2.0	67.30	11.83	-14.75	5.
	4.0	67.30	11.94	-14.75	5.
	6.0	67.30	12.06	-14.75	5.
	8.0	67.30	12.18	-14.75	5.
	10.0	67.30	12.30	-14.75	5.
	12.0	67.30	12.41	-14.75	5.
	14.0	67.30	12.53	-14.75	5.
	16.0	67.30	12.65	-14.75	5.
	18.0	67.30	12.76	-14.75	5.
	20.0	67.30	12.88	-14.75	5.
	22.0	67.30	13.00	-14.75	5.
OVERFLOW	23.1	67.30	13.06	-14.75	5.
	24.0	67.30	13.11	-14.75	5.
	26.0	67.30	13.23	-14.75	5.
	28.0	67.30	13.35	-14.75	5.
	30.0	67.30	13.46	-14.75	5.
	30.7	67.30	13.51	-14.75	0.
					(5) I MAX.

98% OF VOLUME WITH 5° HEEL 5

D.O.SERV.TK.

	VOLUME (CUB.M)	LCG (METER)	VCG (METER)	TCG (METER)	I (M**4)
	0.0	-	15.32	-	-
	2.0	67.30	15.43	-14.75	5.
	4.0	67.30	15.55	-14.75	5.
	6.0	67.29	15.67	-14.75	5.
	8.0	67.29	15.78	-14.75	5.
	10.0	67.29	15.90	-14.75	5.
	12.0	67.29	16.01	-14.75	5.
	14.0	67.28	16.13	-14.75	5.
	16.0	67.28	16.24	-14.75	5.
	18.0	67.28	16.36	-14.75	5.
	20.0	67.28	16.47	-14.75	5.
	22.0	67.28	16.59	-14.75	5.
OVERFLOW	22.8	67.28	16.62	-14.75	5.
	24.0	67.27	16.70	-14.75	5.
	26.0	67.27	16.82	-14.75	5.
	28.0	67.27	16.93	-14.75	5.
	(30.4)	(67.27)	(17.07)	(-14.75)	(5) I MAX.
	30.5	67.27	17.07	-14.75	0.

98% OF VOLUME WITH 5° HEEL 5

D.O.SLUDGE TK.

	VOLUME (CUB.M)	LCG (METER)	VCG (METER)	TCG (METER)	I (M**4)
	0.0	-	6.90	-	-
	1.0	61.70	7.05	-0.39	1.
OVERFLOW	1.5	61.70	7.13	-0.39	1.
	2.0	61.70	7.20	-0.39	1.
	3.0	61.70	7.35	-0.39	1.
	3.7	61.70	7.45	-0.39	0.
					(1) I MAX.

98% OF VOLUME WITH 5° HEEL 1

1128

M/E L.O.STOR.TK.

VOLUME (CUB.M)	LCG (METER)	VCG (METER)	TCG (METER)	I (M**4)
0.0	-	11.71	-	-
2.0	73.70	11.83	-14.75	5.
4.0	73.70	11.94	-14.75	5.
6.0	73.70	12.06	-14.75	5.
8.0	73.70	12.18	-14.75	5.
10.0	73.70	12.30	-14.75	5.
12.0	73.70	12.41	-14.75	5.
14.0	73.70	12.53	-14.75	5.
16.0	73.70	12.65	-14.75	5.
18.0	73.70	12.76	-14.75	5.
20.0	73.70	12.88	-14.75	5.
22.0	73.70	13.00	-14.75	5.
24.0	73.70	13.11	-14.75	5.
26.0	73.70	13.23	-14.75	5.
28.0	73.70	13.35	-14.75	5.
30.0	73.70	13.46	-14.75	5.
32.0	73.70	13.58	-14.75	5.
34.0	73.70	13.70	-14.75	5.
36.0	73.70	13.82	-14.75	5.
38.0	73.70	13.93	-14.75	5.
40.0	73.70	14.05	-14.75	5.
42.0	73.70	14.17	-14.75	5.
44.0	73.70	14.28	-14.75	5.
46.0	73.70	14.40	-14.75	5.
48.0	73.70	14.52	-14.75	5.
50.0	73.70	14.63	-14.75	5.
52.0	73.70	14.75	-14.75	5.
54.0	73.70	14.87	-14.75	5.
56.0	73.70	14.98	-14.75	5.
58.0	73.70	15.10	-14.75	5.
(60.6)	(73.70)	(15.26)	(-14.75)	(5) I MAX.
60.8	73.70	15.26	-14.75	0.

98% OF VOLUME WITH 5° HEEL 5

BTM.RESERV.L.O.TK.

VOLUME (CUB.M)	LCG (METER)	VCG (METER)	TCG (METER)	I (M**4)
0.0	-	0.0	-	-
2.0	73.70	0.02	0.0	36.
4.0	73.70	0.03	0.0	46.
6.0	73.70	0.05	0.0	46.
8.0	73.70	0.07	0.0	46.
10.0	73.70	0.08	0.0	46.
12.0	73.70	0.10	0.0	46.
14.0	73.70	0.12	0.0	46.
16.0	73.70	0.13	0.0	46.
18.0	73.70	0.15	0.0	46.
20.0	73.70	0.16	0.0	46.
22.0	73.70	0.18	0.0	46.
24.0	73.70	0.20	0.0	46.
26.0	73.70	0.21	0.0	46.
28.0	73.70	0.23	0.0	46.
30.0	73.70	0.25	0.0	46.
32.0	73.70	0.26	0.0	46.
34.0	73.70	0.28	0.0	46.
(35.5)	(73.70)	(0.29)	(0.0)	(46) I MAX.
38.0	73.70	0.31	0.0	41.
40.0	73.70	0.33	0.0	41.
42.0	73.70	0.35	0.0	41.
44.0	73.70	0.36	0.0	41.
46.0	73.77	0.38	0.0	9.
48.0	73.98	0.40	0.0	9.
50.0	74.17	0.43	0.0	9.
52.0	74.34	0.46	0.0	9.
54.0	74.51	0.50	0.0	9.
56.0	74.66	0.54	0.0	9.
56.6	74.70	0.55	0.0	0.

98% OF VOLUME WITH 5° HEEL 9

BTM.L.O.SUMP.TK.

VOLUME (CUB.M)	LCG (METER)	VCG (METER)	TCG (METER)	I (M**4)
0.0	-	0.60	-	-
2.0	73.27	0.73	0.0	37.
4.0	72.89	0.77	0.0	37.
6.0	72.75	0.80	0.0	37.
8.0	72.69	0.83	0.0	37.
10.0	72.65	0.85	0.0	37.
12.0	72.62	0.87	0.0	37.
14.0	72.61	0.89	0.0	37.
16.0	72.59	0.91	0.0	37.
18.0	72.58	0.93	0.0	37.
20.0	72.57	0.95	0.0	37.
22.0	72.57	0.97	0.0	37.
24.0	72.56	1.00	0.0	37.
26.0	72.56	1.02	0.0	37.
28.0	72.55	1.04	0.0	37.
30.0	72.55	1.06	0.0	37.
32.0	72.55	1.08	0.0	37.
34.0	72.54	1.10	0.0	37.
36.0	72.54	1.12	0.0	37.
38.0	72.54	1.14	0.0	37.
40.0	72.54	1.16	0.0	37.
42.0	72.54	1.18	0.0	37.
44.0	72.53	1.20	0.0	37.
46.0	72.53	1.22	0.0	37.
47.9	72.53	1.24	0.0	0.
				(37) I MAX.

98% OF VOLUME WITH 5° HEEL 37

L.O.SLUDGE TK.

	VOLUME (CUB.M)	LCG (METER)	VCG (METER)	TCG (METER)	I (M**4)
	0.0	-	6.90	-	-
	1.0	60.10	6.97	0.79	12.
	2.0	60.10	7.04	0.79	12.
	3.0	60.10	7.11	0.79	12.
OVERFLOW	3.2	60.10	7.13	0.79	12.
	4.0	60.10	7.18	0.79	12.
	5.0	60.10	7.25	0.79	12.
	6.0	60.10	7.32	0.79	12.
	7.0	60.10	7.39	0.79	12.
	7.8	60.10	7.45	0.79	0.
					(12) I MAX.

98% OF VOLUME WITH 5° HEEL 12

44

S/T L.O.DRAIN TK.

VOLUME (CUB.M)	LCG (METER)	VCG (METER)	TCG (METER)	I (M**4)
0.0	-	1.68	-	-
1.0	98.88	1.75	0.0	2.
2.0	98.88	1.82	0.0	2.
3.0	98.88	1.88	0.0	2.
4.0	98.88	1.95	0.0	2.
5.0	98.88	2.02	0.0	2.
5.9	98.88	2.08	0.0	0.
				(2) I MAX.

98% OF VOLUME WITH 5° HEEL 2

45

CYL.O.STOR.TK.

VOLUME (CUB.M)	LCG (METER)	VCG (METER)	TCG (METER)	I (M**4)
0.0	-	15.31	-	-
2.0	78.50	15.37	14.75	11.
4.0	78.50	15.43	14.75	11.
6.0	78.50	15.49	14.75	11.
8.0	78.50	15.55	14.75	11.
10.0	78.50	15.61	14.75	11.
12.0	78.50	15.66	14.75	11.
14.0	78.50	15.72	14.75	11.
16.0	78.50	15.78	14.75	11.
18.0	78.50	15.84	14.75	11.
20.0	78.50	15.90	14.75	11.
22.0	78.50	15.96	14.75	11.
24.0	78.50	16.01	14.75	11.
26.0	78.50	16.07	14.75	11.
28.0	78.50	16.13	14.75	11.
30.0	78.50	16.19	14.75	11.
32.0	78.50	16.25	14.75	11.
34.0	78.50	16.31	14.75	11.
36.0	78.50	16.37	14.75	11.
38.0	78.50	16.42	14.75	11.
40.0	78.50	16.48	14.75	11.
42.0	78.50	16.54	14.75	11.
44.0	78.50	16.60	14.75	11.
46.0	78.50	16.66	14.75	11.
48.0	78.50	16.72	14.75	11.
50.0	78.50	16.77	14.75	11.
52.0	78.50	16.83	14.75	11.
54.0	78.50	16.89	14.75	11.
56.0	78.50	16.95	14.75	11.
(59.6)	(78.50)	(17.06)	(14.75)	(11) I MAX.
59.9	78.50	17.06	14.75	0.

98% OF VOLUME WITH 5° HEEL 11

46

SOOT CLEAN W.TK.

VOLUME (CUB.M)	LCG (METER)	VCG (METER)	TCG (METER)	I (M**4)
0.0	-	8.01	-	-
2.0	78.30	8.11	-14.25	3.
4.0	78.31	8.20	-14.27	3.
6.0	78.32	8.29	-14.29	4.
8.0	78.33	8.37	-14.32	4.
10.0	78.34	8.45	-14.34	5.
12.0	78.35	8.53	-14.35	5.
14.0	78.36	8.61	-14.37	6.
16.0	78.36	8.69	-14.39	6.
18.0	78.37	8.77	-14.40	6.
20.0	78.38	8.84	-14.42	7.
22.0	78.38	8.92	-14.43	7.
24.0	78.39	8.99	-14.45	7.
26.0	78.39	9.06	-14.46	8.
28.0	78.39	9.13	-14.47	8.
30.0	78.40	9.20	-14.48	8.
32.0	78.40	9.27	-14.49	8.
34.0	78.41	9.34	-14.50	9.
36.0	78.41	9.41	-14.51	9.
38.0	78.41	9.47	-14.52	9.
40.0	78.41	9.54	-14.53	9.
40.9	78.41	9.57	-14.53	0.
				(9) I MAX.

98% OF VOLUME WITH 5° HEEL 9

47

CLEAN DRAIN TK.

VOLUME (CUB.M)	LCG (METER)	VCG (METER)	TCG (METER)	I (M**4)
0.0	-	0.18	-	-
1.0	77.54	0.57	-3.00	0.
2.0	77.77	0.69	-3.08	0.
3.0	77.88	0.80	-3.13	1.
4.0	77.95	0.88	-3.18	1.
5.0	77.99	0.96	-3.22	2.
6.0	78.03	1.04	-3.25	2.
7.0	78.05	1.10	-3.28	2.
8.0	78.07	1.17	-3.31	3.
9.0	78.08	1.23	-3.34	3.
10.0	78.09	1.29	-3.37	4.
11.0	78.10	1.35	-3.39	4.
12.0	78.10	1.40	-3.42	5.
13.0	78.11	1.45	-3.44	5.
14.0	78.11	1.50	-3.47	6.
15.0	78.12	1.55	-3.49	6.
16.0	78.12	1.60	-3.51	6.
17.0	78.13	1.64	-3.52	6.
17.8	78.14	1.68	-3.54	0.
				(6) I MAX.

98% OF VOLUME WITH 5° HEEL 6

WASTE OIL TK.

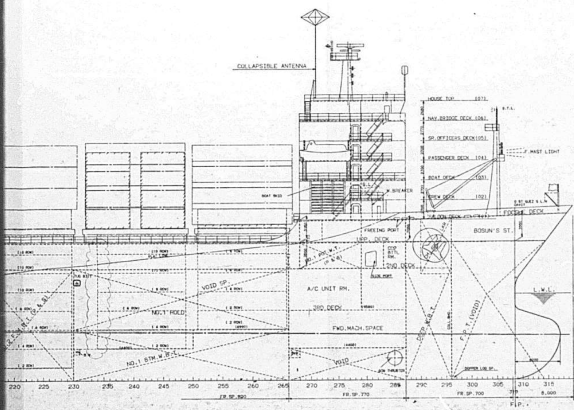
VOLUME (CUB.M)	LCG (METER)	VCG (METER)	TCG (METER)	I (M**4)
0.0	-	0.94	-	-
1.0	65.35	1.32	6.72	5.
2.0	65.38	1.42	6.91	9.
3.0	65.41	1.49	7.04	12.
4.0	65.44	1.54	7.15	16.
5.0	65.46	1.59	7.23	18.
6.0	65.48	1.64	7.31	22.
7.0	65.50	1.68	7.38	25.
8.0	65.51	1.71	7.44	27.
9.0	65.53	1.75	7.50	30.
10.0	65.54	1.78	7.55	33.
11.0	65.55	1.81	7.60	35.
(11.8)	(65.56)	(1.84)	(7.64)	(36) I MAX.
13.0	65.57	1.87	7.68	35.
14.0	65.58	1.90	7.71	34.
15.0	65.59	1.93	7.73	32.
16.0	65.60	1.96	7.75	31.
17.0	65.60	1.98	7.77	30.
17.8	65.60	2.01	7.78	0.

98% OF VOLUME WITH 5° HEEL 30

BILGE TK.

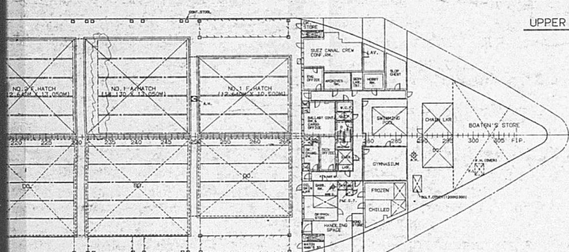
VOLUME (CUB.M)	LCG (METER)	VCG (METER)	TCG (METER)	I (M**4)
0.0	-	0.0	-	-
2.0	87.11	0.09	0.0	12.
4.0	87.11	0.16	0.0	19.
6.0	87.11	0.22	0.0	26.
8.0	87.11	0.28	0.0	32.
10.0	87.11	0.34	0.0	38.
12.0	87.12	0.39	0.0	45.
14.0	87.12	0.44	0.0	50.
16.0	87.12	0.50	0.0	55.
18.0	87.12	0.54	0.0	61.
20.0	87.12	0.59	0.0	67.
22.0	87.12	0.63	0.0	72.
24.0	87.12	0.68	0.0	76.
26.0	87.12	0.72	0.0	81.
28.0	87.12	0.76	0.0	86.
30.0	87.12	0.81	0.0	91.
32.0	87.12	0.85	0.0	95.
34.0	87.13	0.89	0.0	100.
36.0	87.13	0.93	0.0	104.
38.0	87.13	0.97	0.0	108.
40.0	87.13	1.01	0.0	112.
42.0	87.13	1.04	0.0	116.
44.0	87.13	1.08	0.0	120.
46.0	87.13	1.12	0.0	124.
48.0	87.13	1.16	0.0	128.
50.0	87.13	1.19	0.0	132.
52.0	87.13	1.23	0.0	136.
54.0	87.13	1.26	0.0	140.
56.0	87.13	1.30	0.0	143.
58.0	87.13	1.33	0.0	146.
60.0	87.13	1.37	0.0	149.
62.0	87.13	1.40	0.0	152.
62.4	87.13	1.41	0.0	0.
				(153) I MAX.

98% OF VOLUME WITH 5° HEEL 152

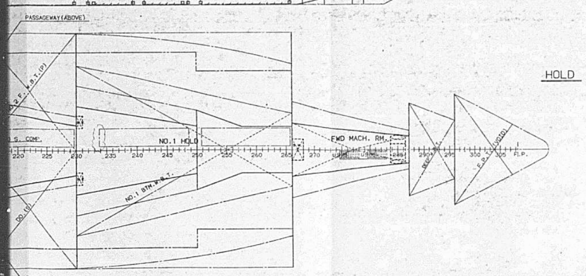


		NO.1 HOLD				HOLD NUMBER		
4		3	2	1		ROW NUMBER		
	-	8	8	-	-	20'	MAX. SPACE FOR EACH CONTAINER SIZE	ON DECK
52		52		50		40'		
(2 TO 4 TIERS ONLY)		52		39 (2 TO 4 TIERS ONLY)		45'		
123.5 TEU		130 TEU		119.5 TEU		MAX. TEU		
	50	-	-	22	22	20'	MAX. SPACE FOR EACH CONTAINER SIZE	IN HOLD
50		40		22		40'		
-		-		-		45'		
100 TEU		80 TEU		44 TEU		MAX. TEU		

UPPER DK.



HOLD



WATER BALLAST TANKS

S.G.=1.025

COMPARTMENT		LOCATION (FR. NO.)	CAPACITY 100% (M^3)	WEIGHT 100% (MT)	CENTER OF GRAVITY(M) LCG	VCG	TCG	MAX. F.S. (MT-M)
DEEP W.B. TANK		287-296	371.4	380.7	-110.28	9.23	0.0	371
NO.1 BTM. W.B. TANK		230-266	1527.1	1565.3	-76.10	3.92	0.0	9422
NO.2 F. W.B. TANK	P	214-230	552.0	565.8	-55.07	7.12	-10.07	287
	S	214-230	552.0	565.8	-55.07	7.12	10.07	287
NO.2 A. W.B. TANK	P	194-214	769.9	789.1	-40.20	6.63	-10.88	1131
	S	194-214	770.7	790.0	-40.24	6.63	10.87	1138
NO.3 BTM. W.B. TANK	P	160-194	402.6	412.7	-16.74	0.98	-7.37	2503
	S	160-194	402.6	412.7	-16.74	0.98	7.37	2503
NO.4 F.W. W.B. TANK	P	142-158	469.1	480.8	3.82	8.61	-14.74	23
	S	142-158	469.1	480.8	3.82	8.61	14.74	23
NO.4 BTM. W.B. TANK	P	122-158	608.4	623.6	12.19	0.92	-8.94	4995
	S	122-158	608.4	623.6	12.19	0.92	8.94	4995
NO.4 A.W. W.B. TANK	P	122-142	590.8	605.6	18.56	8.56	-14.75	28
	S	122-142	590.8	605.6	18.56	8.56	14.75	28
NO.5 BTM. W.B. TANK	P	84-122	518.7	531.7	40.47	0.96	-8.12	3932
	S	84-122	518.7	531.7	40.47	0.96	8.12	3932
NO.5 WING W.B. TANK	P	103-122	552.8	566.6	34.50	8.65	-14.73	27
	S	103-122	552.8	566.6	34.50	8.65	14.73	27
NO.6 WING W.B. TANK	P	31- 50	566.0	580.2	91.13	10.07	-11.29	828
	S	31- 50	566.0	580.2	91.13	10.07	11.29	828
AFT PEAK TANK	P	A.E.-16	442.3	453.4	118.16	12.12	-5.65	2982
	S	A.E.-16	450.7	462.0	118.29	12.12	5.65	3115
ANTI-HEELING TANK	P	84-103	600.9	615.9	49.83	8.13	-14.21	158
	S	84-103	600.9	615.9	49.83	8.13	14.21	158
TOTAL			14054.7	14406.3	-	-	-	-

FRESH WATER TANKS

S.G.=1.000

COMPARTMENT		LOCATION (FR. NO.)	CAPACITY 100% (M^3)	WEIGHT 100% (MT)	CENTER OF GRAVITY(M) LCG	VCG	TCG	MAX. F.S. (MT-M)
NO.1 POT W. TANK	P	268-279	116.5	116.5	-96.62	17.44	-10.64	219
	S	268-279	116.5	116.5	-96.62	17.44	10.64	219
NO.2 POT W. TANK		58- 69	111.4	111.4	73.09	14.95	14.69	14
DIST. W. TANK		54- 58	30.6	30.6	80.10	13.51	-14.75	5
TOTAL			375.0	375.0	-	-	-	-
COOL. W. TANK		A.E.-21	90.1	90.1	109.45	4.60	0.0	11

FUEL OIL TANKS

H(HEAVY OIL) : S.G.=0.980
I(INTERMEDIATE OIL) : S.G.=0.940

COMPARTMENT		LOCATION (FR. NO.)	CAPACITY 100% EXCEPT • (M^3)	WEIGHT 98% OR • (MT) H	I	CENTER OF GRAVITY(M) LCG	VCG	TCG	MAX. F.S. (MT-M) H	I
NO.3 F.W. F.O. TANK	P	178-194	466.7	448.2	429.9	-25.76	8.43	-14.17	37	36
	S	178-194	466.7	448.2	429.9	-25.76	8.43	14.17	37	36
NO.3 A.W. F.O. TANK	P	158-178	567.8	545.3	523.1	-10.94	8.65	-14.65	26	25
	S	158-178	567.8	545.3	523.1	-10.94	8.65	14.65	26	25
DEEP F.O. TANK	P	70-83	• 468.9	459.5	440.8	62.01	7.88	-12.32	548	525
	S	70-83	• 476.5	467.0	447.9	62.83	8.26	12.36	550	527
H.F.O. SETT. TANK	P	78-83	• 118.2	115.8	111.1	60.57	10.40	- 9.49	156	149
	S	78-83	• 117.4	115.1	110.4	60.53	11.52	12.69	80	77
H.F.O. SERV. TANK		78-83	• 121.7	119.3	114.4	60.61	12.12	7.71	25	24
TOTAL			3371.7	3263.7	3130.6	-	-	-	-	-
F.O. DRAIN TANK		79-83	56.5	54.3	52.0	60.41	1.05	0.0	349	335
H.F.O. SLUDGE TANK		78-80	• 1.7	1.7	1.6	61.70	7.13	1.85	2	2

DIESEL OIL TANKS

S.G.=0.900

COMPARTMENT		LOCATION (FR. NO.)	CAPACITY 100% EXCEPT • (M^3)	WEIGHT 98% OR • (MT)	CENTER OF GRAVITY(M) LCG	VCG	TCG	MAX. F.S. (MT-M)
DIESEL OIL TANK	P	66-79	86.7	76.5	66.27	1.54	- 4.68	276
	S	54-79	101.0	89.1	69.33	1.50	3.93	96
D.O.SETT.TANK		70-74	• 23.1	20.8	67.30	13.06	-14.75	5
D.O.SERV.TANK		70-74	• 22.8	20.5	67.28	16.62	-14.75	5
TOTAL			233.6	206.9	-	-	-	-
D.O. SLUDGE TANK		78-80	• 1.5	1.4	61.70	7.13	- 0.39	1

LUB. OIL TANKS

S.G.=0.900

COMPARTMENT	LOCATION (FR. NO.)	CAPACITY 100% EXCEPT • (M^3)	WEIGHT 98% OR • (MT)	CENTER OF GRAVITY(M) LCG	VCG	TCG	MAX. F.S. (MT-M)
M/E L.O. STOR. TANK	62-66	60.8	53.6	73.70	15.19	-14.75	5
BTM. RESERVE L.O. TANK	61-77	56.6	49.9	74.62	0.53	0.0	41
BTM. L.O. SUMP TANK	55-76	47.9	42.2	72.53	1.23	0.0	33
TOTAL		165.3	145.7	-	-	-	-
L.O. SLUDGE TANK	80-82	• 3.2	2.9	60.10	7.13	0.79	11
S/T L.O. DRAIN TANK	29-34	5.9	5.2	98.88	2.07	0.0	2
CYL. O. STOR. TANK	54-62	59.9	52.8	78.50	17.03	14.75	10

MISCELLANEOUS TANKS

S.G.=1.000

COMPARTMENT	LOCATION (FR. NO.)	CAPACITY 100% (M^3)	WEIGHT 100% (MT)	CENTER OF GRAVITY(M) LCG	VCG	TCG	MAX. F.S. (MT-M)
SOOT CLEAN WATER TANK	54-62	40.9	40.9	78.41	9.57	-14.53	9
CLEAN DRAIN TANK	54-62	17.8	17.8	78.14	1.68	- 3.54	6
WASTE OIL TANK	70-78	17.8	17.8	65.60	2.01	7.78	36
BILGE TANK	44-50	62.4	62.4	87.13	1.41	0.00	153

NOTES :

1. CENTER OF GRAVITY

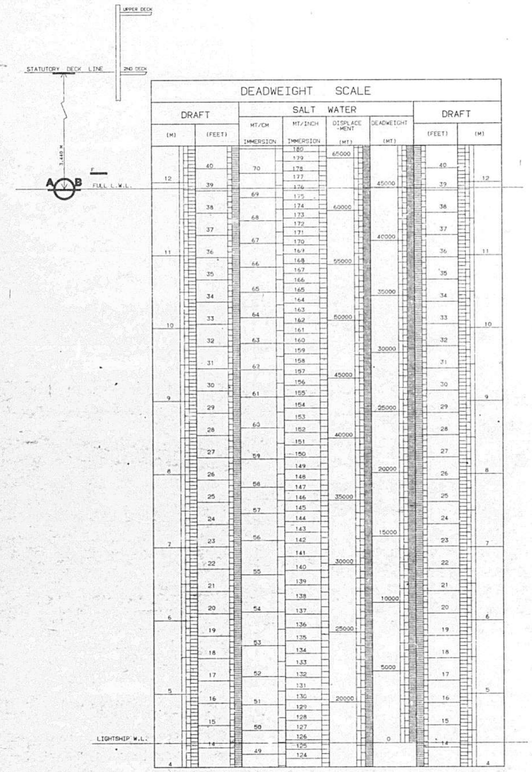
   LCG : LONGITUDINAL CENTER OF GRAVITY FROM MIDSHIP
   VCG : VERTICAL CENTER OF GRAVITY ABOVE TOP OF KEEL
   TCG : TRANSVERSE CENTER OF GRAVITY FROM CENTER LINE

   REFERENCE LINES-

   LCG-----MINUS SIGN(-) : FOWARD OF MIDSHIP; NO SIGN : AFT OF MIDSHIP
   TCG-----MINUS SIGN(-) : PORT OF CENTER LINE; NO SIGN : STARBOARD OF CENTER LINE

2. THE CAPACITIES WITH • MARK SHOWS THE VALUE TO OVERFLOW PIPE.
3. WEIGHTS FOR FO, DO AND LO ARE AT 98% FULL UNLESS CAPACITY HAS • MARK WHERE WEIGHT IS CALCULATED TO OVERFLOW PIPE.

DEADWEIGHT SCALE



DEADWEIGHT

	FREEBOARD (M)	DRAFT (M)	DRAFT (FT-IN)	DEADWEIGHT (MT)
F	3.216	12.144	39-10 1/8	44981
S	3.440	11.920	39- 1 1/4	44966

TONNAGE

	GROSS (TONS)	NET (TONS)
INTERNATIONAL	39132	15633
USA	36799.54	24112
SUEZ CANAL	40106.54	34136.10
PANAMA CANAL	40622.36	32035.57

PLAN RECORD

ALT. NO.	MARK	ALTERATION/DESCRIPTION	DATE & SIGNATURE
		PREPARED FOR S. NO. 1323 AS FINISHED PLAN, MADE APPLICABLE TO S. NO. 1324 AND S. NO. 1325.	
		REVISED THE AREAS WITH ☁ MARK FOR APL MODIFICATION.	MAR. 5, 1987 K.A.

PRINCIPAL PARTICULARS

LENGTH OVER ALL	:	259.0 M
LENGTH BETWEEN PERPENDICULARS	:	245.000 M
BREADTH OVER ALL	:	32.284 M
BREADTH MOULDED	:	32.200 M
DEPTH MOULDED	:	18.800 M
FULL LOAD KEEL DRAFT	:	11.920 M
DESIGN KEEL DRAFT	:	10.290 M

APPROVAL OF OWNER & REGULATORY BODIES

ALT. NO.	OWNER DATE	OWNER LETTER NO.	ABS(NY)/USCG DATE	ABS(NY)/USCG LETTER NO.	DATE	LETTER NO.
ORIGINAL						

FINISHED PLAN

SHIPYARD AND SHIP'S NO. & NAME			
MITSUI TAMANO		MITSUBISHI KOBE	
NO.1323	DOCTOR LYKES	NO.1158	JAMES LYKES
NO.1324	ALMERIA LYKES	NO.1159	JOSEPH LYKES
NO.1325	TILLIE LYKES	NO.1164	SOLON TURMAN

MITSUI ENGINEERING & SHIPBUILDING CO.,LTD.
TAMANO WORKS

SHIP DESIGN DEPARTMENT — SHIP'S NO. 1325 — SHIP'S NAME TILLIE LYKES

CO-ORDINATION SECT

APL MODIFICATION

CAPACITY PLAN WITH DEADWEIGHT SCALE

SCALE 1/200 — LYKES REF. NO. 290102 — MITSUI DRAWING NO. 1102061M

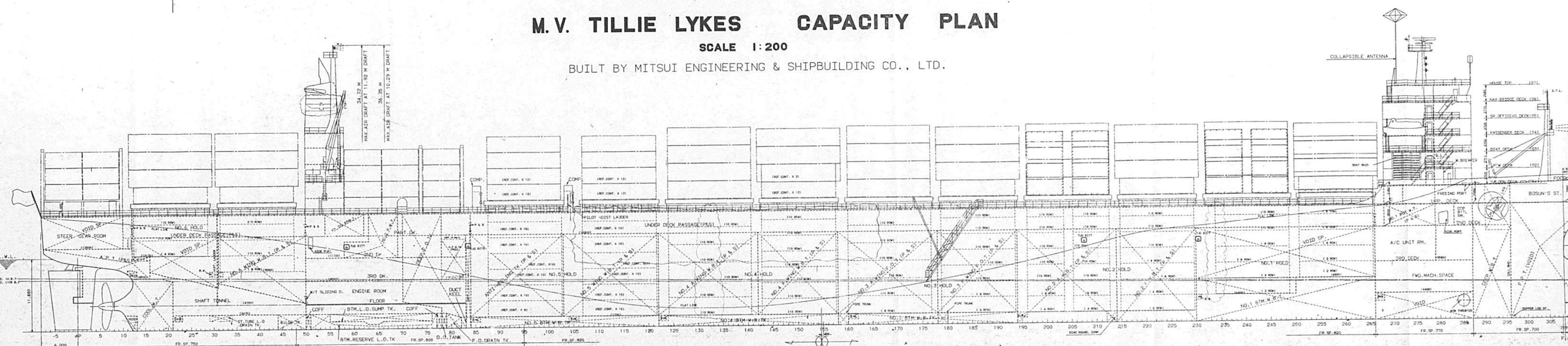
1/4

1132

M.V. TILLIE LYKES CAPACITY PLAN

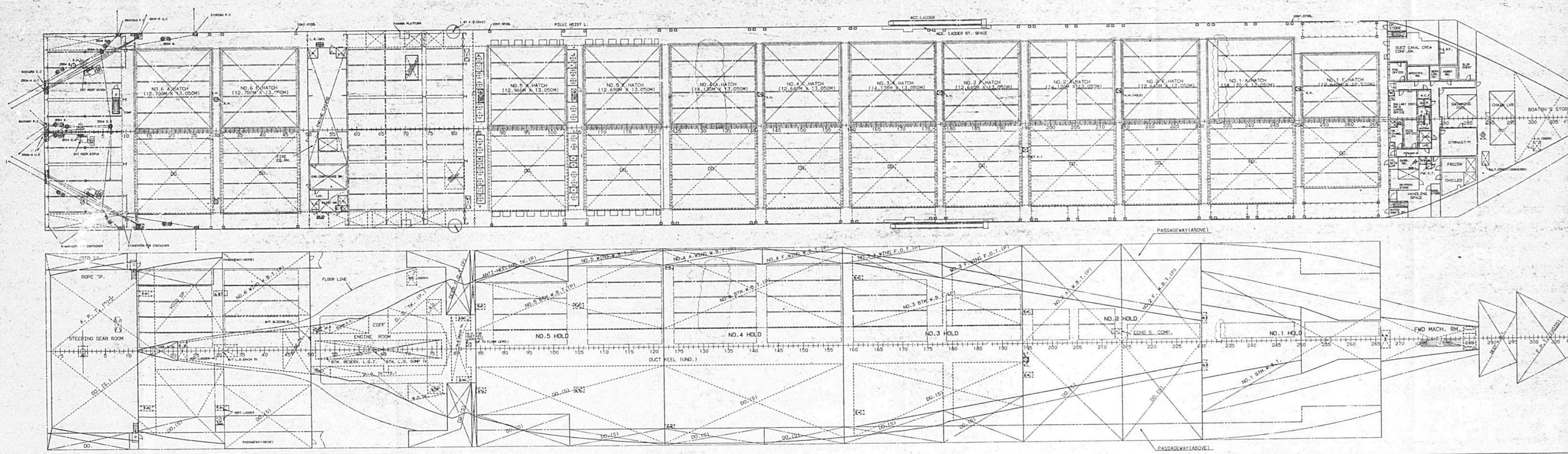
SCALE 1:200

BUILT BY MITSUI ENGINEERING & SHIPBUILDING CO., LTD.



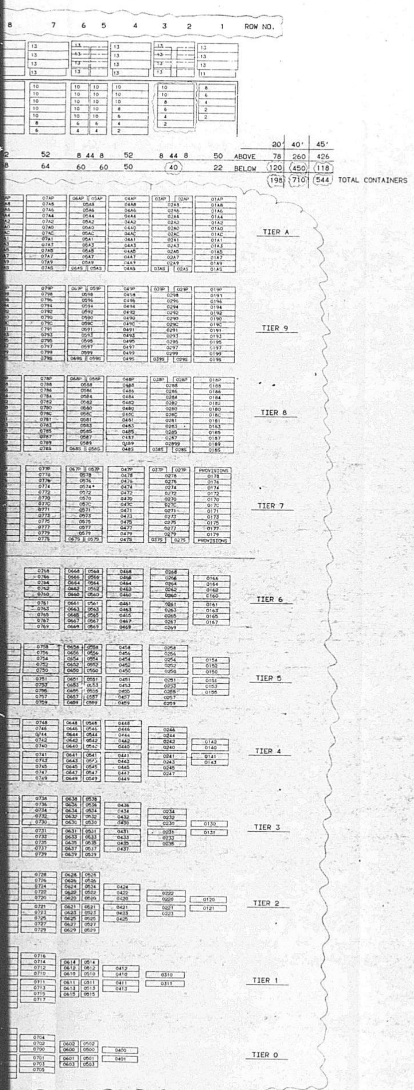
	TOTAL	
ON DECK	20' CONT.	238
	40' CONT.	702 (INCLUD 40' REF 60)
	45' CONT.	520
	TEU	1,710 TEU (INCLUD 40' REF 60)
IN HOLD	20' CONT.	664
	40' CONT.	518 (INCLUD 40' REF 48)
	45' CONT.	118
	TEU	1,310 TEU (INCLUD 40' REF 48)

HOLD NUMBER	ROW NUMBER	ON DECK: MAX. SPACE FOR EACH CONTAINER SIZE 20'	40'	45'	MAX. TEU	IN HOLD: MAX. SPACE FOR EACH CONTAINER SIZE 20'	40'	45'	MAX. TEU
ON STOOL	18	36	36	-	72 TEU				
	17	36							
NO.6 HOLD	16	- -	52	39 (2 TO 4 TIERS ONLY)	123.5 TEU	28 28	28	-	56 TEU
	15	- -	52	39 (2 TO 4 TIERS ONLY)	123.5 TEU	38 38	38	-	76 TEU
ON ENGINE RM	14	44 44	44	-	88 TEU				
	13	46	-	-	46 TEU				
NO.5 HOLD	12	-	52 (DRY CONT 30 + REF CONT 22)	39 (2 TO 4 TIERS ONLY)	123.5 TEU	-	68 FEU (DRY 20FEU + REF 48FEU)	-	136 TEU
	11	-	52 (DRY CONT 30 + REF CONT 22)	39 (2 TO 4 TIERS ONLY)	123.5 TEU	-	70 FEU (DRY 10FEU + REF 60FEU)	-	140 TEU
NO.4 HOLD	10	-	52	52	130 TEU	- -	60	-	150 TEU
	9	-	52 (DRY CONT 36 + REF CONT 16)	39 (2 TO 4 TIERS ONLY)	123.5 TEU	70 70	70	-	140 TEU
NO.3 HOLD	8	-	52	52	130 TEU	-	68	58	145 TEU
	7	-	52	39 (2 TO 4 TIERS ONLY)	123.5 TEU	64 64	64	-	128 TEU
NO.2 HOLD	6	8	52	52	130 TEU	60 60	-	-	120 TEU
	5	8							
	4	- -	52	39 (2 TO 4 TIERS ONLY)	123.5 TEU	50 50	50	-	100 TEU
NO.1 HOLD	3	8	52	52	130 TEU	- -	40	-	80 TEU
	2	8							
	1	- -	50	39 (2 TO 4 TIERS ONLY)	119.5 TEU	22 22	22	-	44 TEU

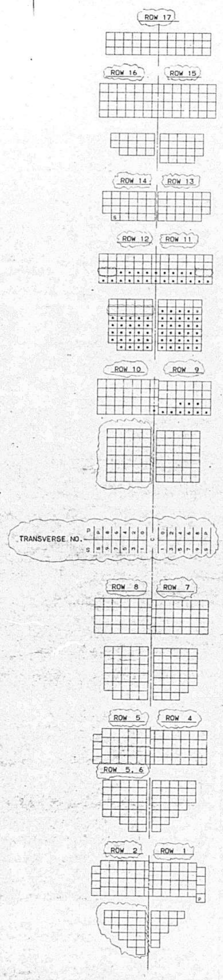


2/4

1133



20'	40'	45'	
78	260	426	ABOVE
120	450	118	BELOW
198	710	544	TOTAL CONTAINERS



KEY TO CONTAINER POSITION NUMBERS

04 6 8 — TRANSVERSE / TIER / ROW

REEFER CONTAINER POSITIONS : •
PROVISIONS CONTAINER POSITION : P
STORES CONTAINER POSITION : S

BUILDER: MITSUI ENGINEERING & SHIPBUILDING CO.,LTD.
CLASS : ABS + A1 E,+ AMS,+ ACCU

MAIN ENGINE
1-DIESEL ENGINE MITSUI B&W 9L80MCE
TWO STROKE CYCLE, SINGLE ACTING, SOLID INJECTION, CROSSHEAD,
DIRECT REVERSIBLE, TURBOCHARGED MARINE DIESEL ENGINE
WITH 9 CYLINDERS, 800 MM CYLINDER BORE, 2,592 MM STROKE
MAXIMUM CONTINUOUS RATING 28800 PS BY 83.0 RPM
1-SHAFT GENERATOR SIEMENS TYPE 2000 KW

AUXILIARY ENGINES
1-GENERATOR TURBINE MITSUBISHI HEAVY INDUSTRIES LTD. AT-34E
WITH GENERATOR SHINKO ELECTRIC 800 KW
3-GENERATORS DIESEL ENGINE DAIHATSU 6DL-24 1170 PS
WITH GENERATOR SHINKO ELECTRIC 800 KW
1-EMERGENCY GENERATOR G.M. DETROIT DIESEL 8V-71T 210 KW

STEERING GEAR
TYPE: ELECTRO-HYDRAULIC
QUANTITY: 1 SET
DIA OF RUDDER STOCK: 655 MM TAPER 1/15
MAKER: MHI NAGASAKI SHIPYARD & ENGINE WORKS, JAPAN
TORQUE: 233 MT-M

NAUTICAL EQUIPMENT

STEERING CONTROL	TOKYO KEIKI PR-7507
RADAR	SELESMAR AUTOTRACK 1660/12S & ARP 1645/9X
WT STATION	ITT MACKAY
VHF-TELEPHONE	ITT MACKAY
PORTABLE LIFE BOAT WT SET	ITT MACKAY 403A
RADIO DIRECTION FINDER	ITT MACKAY
LORAN & NNSS	RACAL-DECCA MNS2000
WEATHER-CHART-RECEIVER	JRC JAX-29S
ECHO-SOUNDER	FURUNO F-851T
MAGNETIC COMPASS	NUNOTANI HAKUYO KEIKI 165A
GYRO COMPASS	TOKYO KEIKI TG-5000
SHIP'S SPEED LOG	FURUNO MF-220
SATELLITE COMMUNICATION	EB COMMUNICATIONS SATURN 3S

BOATS
2 MOTOR LIFE BOATS 7.46 × 2.90 × 1.15 M 44 PERSONS EACH

DECK MACHINERY
WINDLASS WITH AUTO TENSION WINCH
TYPE : ELECTRO-HYDRAULIC
CAPACITY OF WINDLASS : 25 MT X 9 M/MIN
CAPACITY OF WINCH : 20 MT X 15 M/MIN
QUANTITY : 2 SETS
CHAIN DIA FOR WINDLASS : 78 MM
MAKER : FUKUSHIMA LTD., JAPAN

AUTO TENSION WINCHES
TYPE : ELECTRO-HYDRAULIC
CAPACITY : 20 MT X 15 M/MIN.
QUANTITY : 4 SETS
MAKER : FUKUSHIMA LTD., JAPAN

STORE CRANES
BOATSWAIN'S STORE CRANE
TYPE : ELECTRIC MOTOR DRIVEN JIB TYPE CRANE
CAPACITY : 1.6 MT
QUANTITY : 1 SET
MAKER : DODWELL & CO., LTD.; JAPAN

ENGINE ROOM CRANE
TYPE : ELECTRIC MOTOR DRIVEN JIB TYPE CRANE
CAPACITY : 7 MT
QUANTITY : 1 SET
MAKER : DODWELL & CO., LTD., JAPAN

BOW THRUSTER
TYPE : ELECTRIC MOTOR DRIVEN
NOMINAL THRUST : 14.4 MT
QUANTITY : 1 SET
MAKER : MHI YOKOHAMA DOCKYARD & MACHINERY WORKS, JAPAN

PROVISION STORES

COMPARTMENTS	LOCATION (FR. NO.)	CAPACITY (M^3)
FROZEN	279-287	29.8
CHILLED	279-287	34.9
DRY PROVISION	268-274 1/2	29.5
BONDED STORE	277-279	8.5
HANDLING SPACE	270-279	61.9

MAX. PERMISSIBLE STACK LOAD FOR CONTAINERS

ON DECK :
45 FT CONTAINERS 1A,2A,3A & 4A — 96 LT(97.5 MT)
40 FT CONTAINERS 1A,2A,3A & 4A — 94 LT(95.5 MT)
OTHER HATCHES — 94 LT(95.5 MT)
OUTBOARD 20 FT CONTAINERS 1A & 2A — 60 LT(61.0 MT)

E/R : ROW 13 — 80 LT(81.3 MT)
ROW 14 — 120 LT(121.9 MT)
PED : ROW 17 — 90 LT(91.4 MT)

UNDER DECK : DESIGNED TO ACCOMMODATE FOLLOWING UNIT WEIGHT OF CONTAINERS.
20 FT — 20 LT(20.32 MT)
40 FT — 30 LT(30.48 MT)
45 FT — 32 LT(32.51 MT)

ALLOWABLE UNIFORM LOAD ON HATCH COVER AND TANK TOP

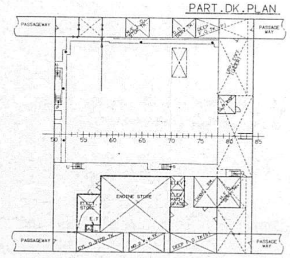
(UNIT : MT/M^2)

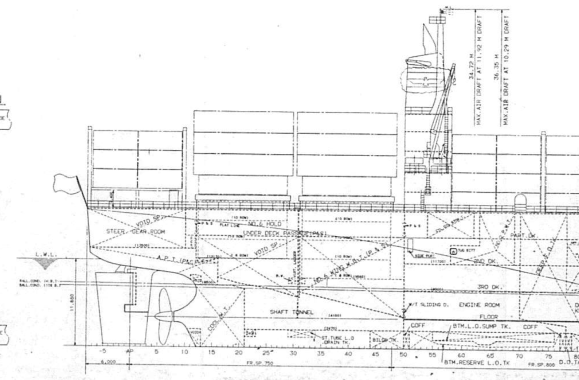
	NO.6 HATCH	NO.5 HATCH	NO.4 HATCH	NO.3 HATCH	NO.2 HATCH	NO.1 HATCH
HATCH COVER	1.30	1.30	1.30	1.30	1.30	1.75
TANK TOP	13.97	13.97	13.97	13.97	13.97	13.97
	NO.6 HOLD	NO.5 HOLD	NO.4 HOLD	NO.3 HOLD	NO.2 HOLD	NO.1 HOLD

ALLOWABLE BENDING MOMENTS, SHEAR FORCES AND TORSIONAL MOMENT

BULKHEAD (FR.NO.)	SHEAR FORCE (MT) AT SEA	SHEAR FORCE (MT) IN PORT	BENDING MOMENT (MT-M) AT SEA	BENDING MOMENT (MT-M) IN PORT	TORSIONAL MOMENT (MT-M)
12	5580	5680	16600	19700	3600
50	3920	5680	111500	143600	
84	7630	10030	226800	318500	
122	7950	10030	287500	457700	
158	8640	10030	287500	480300	
194	8340	10030	231200	405700	
230	7520	10030	125000	244800	
266	3750	6020	39300	84400	
287	5050	6020	11600	28800	

PART.DK.PLAN



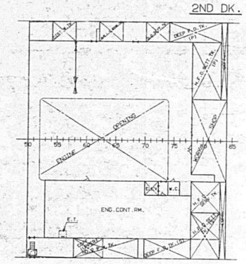


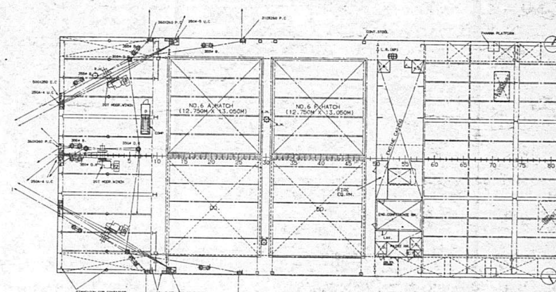
GRAND TOTAL	TOTAL	
20' CONT. 902 MAX. SPACES	20' CONT. 238	
40' CONT. 1,220 MAX. SPACES (INCLUD 40' REF 108) (EXCLUDE 2 PROV.& 2 STORE CONT.)	40' CONT. 702	(INCLUD 40' REF 60)
45' CONT. 638 MAX. SPACES	45' CONT. 520	
	1,710 TEU	(INCLUD 40' REF 60)
3,025 TEU	20' CONT. 664	
(INCLUD: 40' REF. CONT. 108; EXCLUDE: 40' PROV. CONT. 2, 40' STORE CONT. 2)	40' CONT. 518	(INCLUD 40' REF 48)
	45' CONT. 118	
	1,315 TEU	(INCLUD 40' REF 48)

ON STOOL 18	ON STOOL 17	NO.6 HOLD 16	NO.6 HOLD 15
36	36	- -	- -
	36	52	52
	-	39 (2 TO 4 TIERS ONLY)	39 (2 TO 4 TIERS ONLY)
	72 TEU	123.5 TEU	123.5 TEU
		28 28	38 38
		28	38
		-	-
		56 TEU	76 TEU

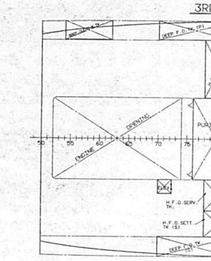
ON ENGINE RM 14	13
44 44	46
44	
88 TEU	46 TEU

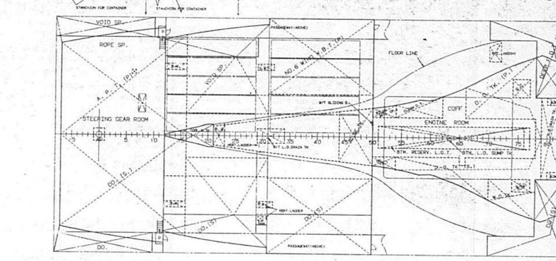
2ND DK.

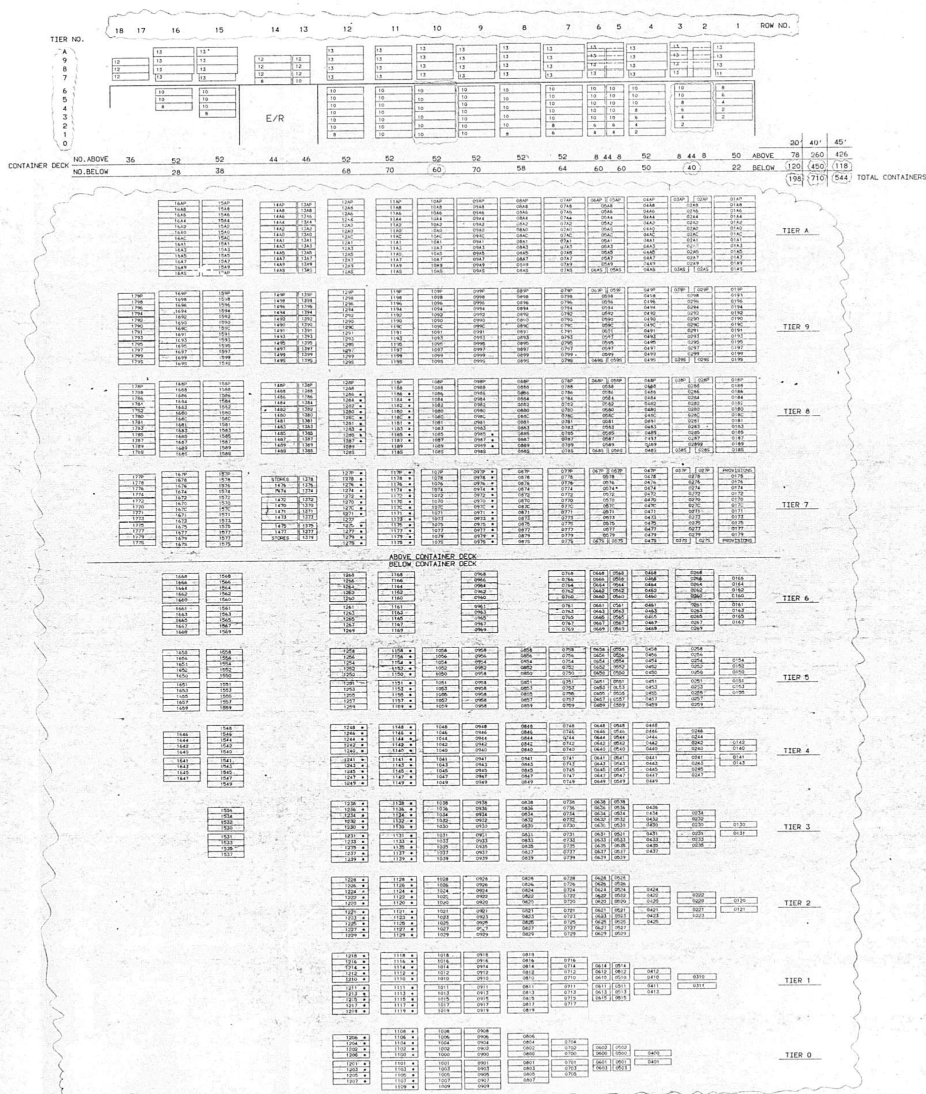




3RD DK.

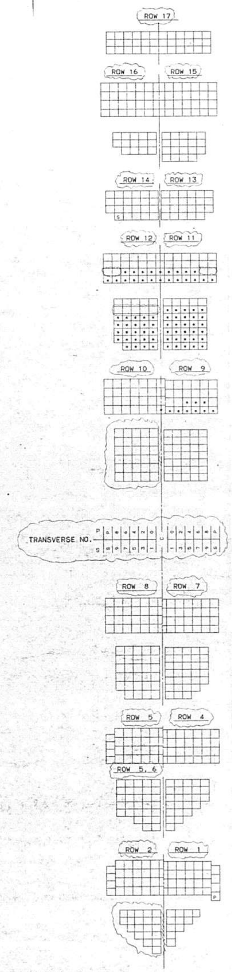




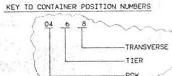


		20'	40'	45'
50	ABOVE	78	260	426
22	BELOW	120	450	118
		198	710	544

TOTAL CONTAINERS



KEY TO CONTAINER POSITION NUMBERS



REEFER CONTAINER POSITIONS : [*]

PROVISIONS CONTAINER POSITION : [P]

STORES CONTAINER POSITION : [S]

BUILDER: MITSUI ENGINEERING & SHIPBUILDING CO.,LTD.
CLASS : ABS + A1 E.+ AMS.+ ACCU

MAIN ENGINE
1-DIESEL ENGINE MITSUI B&W 9L80MCE
TWO STROKE CYCLE, SINGLE ACTING, SOLID INJECTION, CROSSHEAD,
DIRECT REVERSIBLE, TURBOCHARGED MARINE DIESEL ENGINE
WITH 9 CYLINDERS, 800 MM CYLINDER BORE, 2,592 MM STROKE
MAXIMUM CONTINUOUS RATING 28800 PS BY 83.0 RPM
1-SHAFT GENERATOR SIEMENS TYPE 2000 KW

AUXILIARY ENGINES
1-GENERATOR TURBINE MITSUBISHI HEAVY INDUSTRIES LTD. AT-34E
WITH GENERATOR SHINKO ELECTRIC 800 KW
3-GENERATORS DIESEL ENGINE DAIHATSU 6DL-24 1170 PS
WITH GENERATOR SHINKO ELECTRIC 800 KW
1-EMERGENCY GENERATOR G.M. DETROIT DIESEL 8V-71T 210 KW

STEERING GEAR
TYPE: ELECTRO-HYDRAULIC
QUANTITY: 1 SET
DIA OF RUDDER STOCK: 655 MM TAPER 1/15
MAKER: MHI NAGASAKI SHIPYARD & ENGINE WORKS, JAPAN
TORQUE: 233 MT-M

NAUTICAL EQUIPMENT

STEERING CONTROL	TOKYO KEIKI PR-7507
RADAR	SELESMAR AUTOTRACK 1560/12S & ARP 1645/9X
WT STATION	ITT MACKAY
VHF-TELEPHONE	ITT MACKAY
PORTABLE LIFE BOAT WT SET	ITT MACKAY 403A
RADIO DIRECTION FINDER	ITT MACKAY
LORAN & NNSS	RACAL-DECCA MNS2000
WEATHER-CHART-RECEIVER	JRC JAX-29S
ECHO-SOUNDER	FURUNO F-851T
MAGNETIC COMPASS	NUNOTANI HAKUYO KEIKI R165A
GYRO COMPASS	TOKYO KEIKI TG-5000
SHIP'S SPEED LOG	FURUNO MF-220
SATELLITE COMMUNICATION	EB COMMUNICATIONS SATURN 3S

BOATS
2 MOTOR LIFE BOATS 7.46 x 2.90 x 1.15 M 44 PERSONS EACH

DECK MACHINERY
WINDLASS WITH AUTO TENSION WINCH
TYPE : ELECTRO-HYDRAULIC
CAPACITY OF WINDLASS : 25 MT X 9 M/MIN
CAPACITY OF WINCH : 20 MT X 15 M/MIN
QUANTITY : 2 SETS
CHAIN DIA FOR WINDLASS : 78 MM
MAKER : FUKUSHIMA LTD., JAPAN

AUTO TENSION WINCHES
TYPE : ELECTRO-HYDRAULIC
CAPACITY : 20 MT X 15 M/MIN.
QUANTITY : 4 SETS
MAKER : FUKUSHIMA LTD., JAPAN

STORE CRANES
BOATSWAIN'S STORE CRANE
TYPE : ELECTRIC MOTOR DRIVEN JIB TYPE CRANE
CAPACITY : 1.6 MT
QUANTITY : 1 SET
MAKER : DODWELL & CO., LTD.: JAPAN

ENGINE ROOM CRANE
TYPE : ELECTRIC MOTOR DRIVEN JIB TYPE CRANE
CAPACITY : 7 MT
QUANTITY : 1 SET
MAKER : DODWELL & CO., LTD., JAPAN

BOW THRUSTER
TYPE : ELECTRIC MOTOR DRIVEN
NOMINAL THRUST : 14.4 MT
QUANTITY : 1 SET
MAKER : MHI YOKOHAMA DOCKYARD & MACHINERY WORKS, JAPAN

PROVISION STORES

COMPARTMENTS	LOCATION (FR. NO.)	CAPACITY (M^3)
FROZEN	279-287	29.8
CHILLED	279-287	34.9
DRY PROVISION	268-274 1/2	29.5
BONDED STORE	277-279	8.5
HANDLING SPACE	270-279	61.9

MAX. PERMISSIBLE STACK LOAD FOR CONTAINERS

ON DECK :	45 FT CONTAINERS 1A,2A,3A & 4A	96 LT(97.5 MT)
	40 FT CONTAINERS 1A,2A,3A & 4A	94 LT(95.5 MT)
	OTHER HATCHES	94 LT(95.5 MT)
	OUTBOARD 20 FT CONTAINERS 1A & 2A	60 LT(61.0 MT)
E/R :	ROW 13	80 LT(81.3 MT)
	ROW 14	120 LT(121.9 MT)
PED :	ROW 17	90 LT(91.4 MT)

UNDER DECK : DESIGNED TO ACCOMMODATE FOLLOWING UNIT WEIGHT OF CO[illegible]AINERS.

20 FT	20 LT(20.32 MT)
40 FT	30 LT(30.48 MT)
45 FT	32 LT(32.51 MT)

ALLOWABLE UNIFORM LOAD ON HATCH COVER AND TANK TOP

(UNIT : MT/M^2)

	NO.6		NO.5	NO.4	NO.3	NO.2	NO.1
HATCH	1.30		1.30	1.30	1.30	1.30	1.75
HOLD	13.97		13.97	13.97	13.97	13.97	13.97

ALLOWABLE BENDING MOMENTS, SHEAR FORCES AND TORSIONAL MOMENT

BULKHEAD (FR.NO.)	SHEAR FORCE (MT) AT SEA	SHEAR FORCE (MT) IN PORT	BENDING MOMENT (MT-M) AT SEA	BENDING MOMENT (MT-M) IN PORT	TORSIONAL MOMENT (MT-M)
12	5580	5680	16600	19700	3600
50	3970	5680	111500	143600	
84	7630	10030	226800	318500	
122	7950	10030	287500	457700	
158	8640	10030	287500	480300	
194	8340	10030	231200	405700	
230	7520	10030	125000	244800	
266	3750	6020	39300	84400	
287	5050	6020	11600	28800	

APPROVAL OF OWNER & REGULATORY BODIES								
ALT.NO.	OWNER		USCG		ABS		USPH	
	DATE	LETTER NO.	DATE	LETTER NO.	DATE	LETTER NO.	DATE	LETTER NO.
ORIGINAL								

FINISHEDPLAN

SHIPYARD AND SHIP'S NO. & NAME			
MITSUI TAMANO		MITSUBISHI KOBE	
NO.1323	DOCTOR LYKES	NO.1158	JAMES LYKES
NO.1324	ALMERIA LYKES	NO.1159	JOSEPH LYKES
NO.1325	TILLIE LYKES	NO.1164	SOLON TURMAN

MITSUI ENGINEERING & SHIPBUILDING CO.,LTD.
TAMANO WORKS

SHIP DESIGN DEPARTMENT MANAGER	SHIP'S NO. 1325	SHIP'S NAME TILLIE LYKES
CO-ORDINATION SECTION SEC.CHIEF	APL MODIFICATION LOADING MANUAL	
DATE (TEL)		
JOB NO. TS1323/24/25 JOBCLASSIF.NO.	SCALE —	LYKES REF. NO. 290106 / MITSUI DRAWING NO. 1102101M

(21 SHEETS WITH COVER)

1

PLAN RECORD

ALT.NO.	MARK	ALTERATION/DESCRIPTION	DATE & SIGNATURE
		PREPARED FOR S.NO. 1323 AS FINISHED PLAN, APPLIED TO S.NO. 1325 "TILLIE LYKES" DUE TO SIMILARITY IN DESIGNING, OUTFITTING AND LIGHTSHIP WEIGHT.	NOV. 10, 1986 K.A. MA
		REVISED THE AREAS WITH "◯" MARK AND ADDED APL'S LOADING CONDITIONS FOR APL MODIFICATION.	MAR. 3, 1987 K.A.

3 - 3 CALCULATION SHEETS (BLANK FORM)

2

BENDING MOMENT AND SHEAR FORCE CALCULATION SHEET

COND. NO.	BHD.NO. 1 FR.NO. 12			BHD.NO. 2 FR.NO. 50		
ITEM	W (MT)	ℓ (M)	M=W*ℓ	W (MT)	ℓ (M)	M=W*ℓ
CONSTANT	22	7.53	167	63	22.03	1393
NO.1 HOLD		0.0			0.0	
NO.2 HOLD		0.0			0.0	
NO.3 HOLD		0.0			0.0	
NO.4 HOLD		0.0			0.0	
NO.5 HOLD		0.0			0.0	
NO.6 HOLD		0.0			14.03	
ON NO.1 HATCH(F&A)		0.0			0.0	
ON NO.2 HATCH(F&A)		0.0			0.0	
ON NO.3 HATCH(F&A)		0.0			0.0	
ON NO.4 HATCH(F&A)		0.0			0.0	
ON NO.5 HATCH(F&A)		0.0			0.0	
ON DECK (ROW13-14)		0.0			0.0	
ON NO.6 HATCH(F&A)		0.0			15.10	
ON DECK (ROW17-18)		8.25			36.85	
DEEP WBT		0.0			0.0	
NO.1 BTM.WBT		0.0			0.0	
NO.2 F.WBT (P)		0.0			0.0	
NO.2 F.WBT (S)		0.0			0.0	
NO.2 A.WBT (P)		0.0			0.0	
NO.2 A.WBT (S)		0.0			0.0	
NO.3 BTM.WBT (P)		0.0			0.0	
NO.3 BTM.WBT (S)		0.0			0.0	
NO.4 F.W.WBT (P)		0.0			0.0	
NO.4 F.W.WBT (S)		0.0			0.0	
NO.4 BTM.WBT (P)		0.0			0.0	
NO.4 BTM.WBT (S)		0.0			0.0	
NO.4 A.W.WBT (P)		0.0			0.0	
NO.4 A.W.WBT (S)		0.0			0.0	
NO.5 BTM.WBT (P)		0.0			0.0	
NO.5 BTM.WBT (S)		0.0			0.0	
NO.5 W.WBT (P)		0.0			0.0	
NO.5 W.WBT (S)		0.0			0.0	
NO.6 W.WBT (P)		0.0			6.23	
NO.6 W.WBT (S)		0.0			6.23	
A.P.T. (P)	*	6.50			33.26	
A.P.T. (S)	*	6.60			33.26	
ANTI-HEEL.T. (P)		0.0			0.0	
ANTI-HEEL.T. (S)		0.0			0.0	
NO.1 P.W.T. (P)		0.0			0.0	
NO.1 P.W.T. (S)		0.0			0.0	
NO.2 P.W.T.		0.0			0.0	
DIST.W.T.		0.0			0.0	
NO.3 F.W.FOT (P)		0.0			0.0	
NO.3 F.W.FOT (S)		0.0			0.0	
NO.3 A.W.FOT (P)		0.0			0.0	
NO.3 A.W.FOT (S)		0.0			0.0	
DEEP FOT (P)		0.0			0.0	
DEEP FOT (S)		0.0			0.0	
H.F.O.SETT.T. (P)		0.0			0.0	
H.F.O.SETT.T. (S)		0.0			0.0	
H.F.O.SERV.T.		0.0			0.0	
D.O.T. (P)		0.0			0.0	
D.O.T. (S)		0.0			0.0	
D.O.SETT.T.		0.0			0.0	
D.O.SERV.T.		0.0			0.0	

(1)=TOTAL WEIGHT	(2)=TOTAL MOMENT	BHD.NO. 1		BHD.NO. 2	
(3)=DISPLACEMENT		(1) / (3)	(2)	(1) / (3)	(2)
(4)=TRIM		(4)		(4)	
(5)=d (TABLE 1)		(5)		(5)	
(6)=δd(TABLE 2)		(6)		(6)	
(7)=(6)*(4)		(7)		(7)	
(8)=(5)+(7)		(8)		(8)	
(9)=(8)*(3)		(9)		(9)	
(10)= W'		(10) 721.		(10) 2213.	
SF=(10)+(1)-(9)		SF=		SF=	
	(11)=δb(TABLE 3)		(11)		(11)
	(12)=(4)*(11)		(12)		(12)
	(13)=b (TABLE 4)		(13)		(13)
	(14)=(13)+(12)		(14)		(14)
	(15)=(14)*(3)		(15)		(15)
	(16)= M'		(16) 5145.		(16) 46020.
	BM=(16)+(2)-(15)		BM=		BM=

TRIM BY THE STERN .... +
TRIM BY THE HEAD .... -

HOG MOMENT .... +
SAG MOMENT .... -

13

3

BENDING MOMENT AND SHEAR FORCE CALCULATION SHEET

COND. NO.	BHD.NO. 3 FR.NO. 84			BHD.NO. 4 FR.NO. 122		
ITEM	W (MT)	ℓ (M)	M=W*ℓ	W (MT)	ℓ (M)	M=W*ℓ
CONSTANT	101	36.02	3627	141	52.17	7376
NO.1 HOLD		0.0			0.0	
NO.2 HOLD		0.0			0.0	
NO.3 HOLD		0.0			0.0	
NO.4 HOLD		0.0			0.0	
NO.5 HOLD		0.0			14.02	
NO.6 HOLD		41.23			72.17	
ON NO.1 HATCH(F&A)		0.0			0.0	
ON NO.2 HATCH(F&A)		0.0			0.0	
ON NO.3 HATCH(F&A)		0.0			0.0	
ON NO.4 HATCH(F&A)		0.0			0.0	
ON NO.5 HATCH(F&A)		0.0			14.14	
ON DECK (ROW13-14)		11.20			42.14	
ON NO.6 HATCH(F&A)		42.30			73.24	
ON DECK (ROW17-18)		64.05			94.99	
DEEP WBT		0.0			0.0	
NO.1 BTM.WBT		0.0			0.0	
NO.2 F.WBT (P)		0.0			0.0	
NO.2 F.WBT (S)		0.0			0.0	
NO.2 A.WBT (P)		0.0			0.0	
NO.2 A.WBT (S)		0.0			0.0	
NO.3 BTM.WBT (P)		0.0			0.0	
NO.3 BTM.WBT (S)		0.0			0.0	
NO.4 F.W.WBT (P)		0.0			0.0	
NO.4 F.W.WBT (S)		0.0			0.0	
NO.4 BTM.WBT (P)		0.0			0.0	
NO.4 BTM.WBT (S)		0.0			0.0	
NO.4 A.W.WBT (P)		0.0			0.0	
NO.4 A.W.WBT (S)		0.0			0.0	
NO.5 BTM.WBT (P)		0.0			13.71	
NO.5 BTM.WBT (S)		0.0			13.71	
NO.5 W.WBT (P)		0.0			7.74	
NO.5 W.WBT (S)		0.0			7.74	
NO.6 W.WBT (P)		33.43			64.37	
NO.6 W.WBT (S)		33.43			64.37	
A.P.T. (P)		60.46			91.40	
A.P.T. (S)		60.59			91.53	
ANTI-HEEL.T. (P)		0.0			23.07	
ANTI-HEEL.T. (S)		0.0			23.07	
NO.1 P.W.T. (P)		0.0			0.0	
NO.1 P.W.T. (S)		0.0			0.0	
NO.2 P.W.T.		15.39			46.33	
DIST.W.T.		22.40			53.34	
NO.3 F.W.FOT (P)		0.0			0.0	
NO.3 F.W.FOT (S)		0.0			0.0	
NO.3 A.W.FOT (P)		0.0			0.0	
NO.3 A.W.FOT (S)		0.0			0.0	
DEEP FOT (P)		4.31			35.25	
DEEP FOT (S)		5.13			36.07	
H.F.O.SETT.T. (P)		2.87			33.81	
H.F.O.SETT.T. (S)		2.83			33.77	
H.F.O.SERV.T.		2.91			33.85	
D.O.T. (P)		8.57			39.51	
D.O.T. (S)		11.63			42.57	
D.O.SETT.T.		9.60			40.54	
D.O.SERV.T.		9.58			40.52	

(1)=TOTAL WEIGHT	(2)=TOTAL MOMENT	BHD.NO. 3		BHD.NO. 4	
(3)=DISPLACEMENT		(1) / (3)	(2)	(1) / (3)	(2)
(4)=TRIM		(4)		(4)	
(5)=d (TABLE 1)		(5)		(5)	
(6)=δd(TABLE 2)		(6)		(6)	
(7)=(6)*(4)		(7)		(7)	
(8)=(5)+(7)		(8)		(8)	
(9)=(8)*(3)		(9)		(9)	
(10)= W'		(10) 6743.		(10) 8624.	
SF=(10)+(1)-(9)		SF=		SF=	
	(11)=δb(TABLE 3)		(11)		(11)
	(12)=(4)*(11)		(12)		(12)
	(13)=b (TABLE 4)		(13)		(13)
	(14)=(13)+(12)		(14)		(14)
	(15)=(14)*(3)		(15)		(15)
	(16)= M'		(16) 169871.		(16) 407608.
	BM=(16)+(2)-(15)		BM=		BM=

TRIM BY THE STERN .... +
TRIM BY THE HEAD .... -

HOG MOMENT .... +
SAG MOMENT .... -

14

1136

4

BENDING MOMENT AND SHEAR FORCE CALCULATION SHEET

COND. NO.	BHD.NO. 5 FR.NO. 158			BHD.NO. 6 FR.NO. 194		
ITEM	W (MT)	ℓ (M)	M=W*ℓ	W (MT)	ℓ (M)	M=W*ℓ
CONSTANT	178	67.85	12100	213	83.79	17887
NO.1 HOLD		0.0			0.0	
NO.2 HOLD		0.0			0.0	
NO.3 HOLD		0.0			13.31	
NO.4 HOLD		13.66			43.18	
NO.5 HOLD		43.54			73.06	
NO.6 HOLD		101.69			131.21	
ON NO.1 HATCH(F&A)		0.0			0.0	
ON NO.2 HATCH(F&A)		0.0			0.0	
ON NO.3 HATCH(F&A)		0.0			13.66	
ON NO.4 HATCH(F&A)		13.67			43.19	
ON NO.5 HATCH(F&A)		43.66			73.18	
ON DECK (ROW13-14)		71.66			101.18	
ON NO.6 HATCH(F&A)		102.76			132.28	
ON DECK (ROW17-18)		124.51			154.03	
DEEP WBT		0.0			0.0	
NO.1 BTM.WBT		0.0			0.0	
NO.2 F.WBT (P)		0.0			0.0	
NO.2 F.WBT (S)		0.0			0.0	
NO.2 A.WBT (P)		0.0			0.0	
NO.2 A.WBT (S)		0.0			0.0	
NO.3 BTM.WBT (P)		0.0			15.54	
NO.3 BTM.WBT (S)		0.0			15.54	
NO.4 F.W.WBT (P)		6.58			36.10	
NO.4 F.W.WBT (S)		6.58			36.10	
NO.4 BTM.WBT (P)		14.95			44.47	
NO.4 BTM.WBT (S)		14.95			44.47	
NO.4 A.W.WBT (P)		21.32			50.84	
NO.4 A.W.WBT (S)		21.32			50.84	
NO.5 BTM.WBT (P)		43.23			72.75	
NO.5 BTM.WBT (S)		43.23			72.75	
NO.5 W.WBT (P)		37.26			66.78	
NO.5 W.WBT (S)		37.26			66.78	
NO.6 W.WBT (P)		93.89			123.41	
NO.6 W.WBT (S)		93.89			123.41	
A.P.T. (P)		120.92			150.44	
A.P.T. (S)		121.05			150.57	
ANTI-HEEL.T. (P)		52.59			82.11	
ANTI-HEEL.T. (S)		52.59			82.11	
NO.1 P.W.T. (P)		0.0			0.0	
NO.1 P.W.T. (S)		0.0			0.0	
NO.2 P.W.T.		75.85			105.37	
DIST.W.T.		82.86			112.38	
NO.3 F.W.FOT (P)		0.0			6.52	
NO.3 F.W.FOT (S)		0.0			6.52	
NO.3 A.W.FOT (P)		0.0			21.35	
NO.3 A.W.FOT (S)		0.0			21.35	
DEEP FOT (P)		64.77			94.29	
DEEP FOT (S)		65.59			95.11	
H.F.O.SETT.T. (P)		63.33			92.85	
H.F.O.SETT.T. (S)		63.29			92.81	
H.F.O.SERV.T.		63.37			92.89	
D.O.T. (P)		69.03			98.55	
D.O.T. (S)		72.09			101.61	
D.O.SETT.T.		70.06			99.58	
D.O.SERV.T.		70.04			99.56	

(1)=TOTAL WEIGHT	(2)=TOTAL MOMENT	(1)	(2)	(1)	(2)
(3)=DISPLACEMENT		(3)		(3)	
(4)=TRIM		(4)		(4)	
(5)=∂ (TABLE 1)		(5)		(5)	
(6)=δ∂(TABLE 2)		(6)		(6)	
(7)=(6)*(4)		(7)		(7)	
(8)=(5)+(7)		(8)		(8)	
(9)=(8)*(3)		(9)		(9)	
(10)= W'		(10) 10419.		(10) 12214.	
SF=(10)+(1)-(9)		SF=		SF=	
	(11)=δb(TABLE 3)		(11)		(11)
	(12)=(4)*(11)		(12)		(12)
	(13)=b (TABLE 4)		(13)		(13)
	(14)=(13)+(12)		(14)		(14)
	(15)=(14)*(3)		(15)		(15)
	(16)= M'		(16) 688691.		(16) 1022757.
	BM=(16)+(2)-(15)		BM=		BM=

TRIM BY THE STERN .... + HOG MOMENT .... +
TRIM BY THE HEAD .... - SAG MOMENT .... -

5

BENDING MOMENT AND SHEAR FORCE CALCULATION SHEET

COND. NO.	BHD.NO. 7 FR.NO. 230			BHD.NO. 8 FR.NO. 266		
ITEM	W (MT)	ℓ (M)	M=W*ℓ	W (MT)	ℓ (M)	M=W*ℓ
CONSTANT	247	100.03	24686	278	116.58	32440
NO.1 HOLD		0.0			14.79	
NO.2 HOLD		14.33			43.85	
NO.3 HOLD		42.83			72.35	
NO.4 HOLD		72.70			102.22	
NO.5 HOLD		102.58			132.10	
NO.6 HOLD		160.73			190.25	
ON NO.1 HATCH(F&A)		0.0			13.84	
ON NO.2 HATCH(F&A)		13.66			43.18	
ON NO.3 HATCH(F&A)		43.18			72.70	
ON NO.4 HATCH(F&A)		72.71			102.23	
ON NO.5 HATCH(F&A)		102.70			132.22	
ON DECK (ROW13-14)		130.70			160.22	
ON NO.6 HATCH(F&A)		161.80			191.32	
ON DECK (ROW17-18)		183.55			213.07	
DEEP WBT		0.0			0.0	
NO.1 BTM.WBT		0.0			15.22	
NO.2 F.WBT (P)		6.73			36.25	
NO.2 F.WBT (S)		6.73			36.25	
NO.2 A.WBT (P)		21.60			51.12	
NO.2 A.WBT (S)		21.56			51.08	
NO.3 BTM.WBT (P)		45.06			74.58	
NO.3 BTM.WBT (S)		45.06			74.58	
NO.4 F.W.WBT (P)		65.62			95.14	
NO.4 F.W.WBT (S)		65.62			95.14	
NO.4 BTM.WBT (P)		73.99			103.51	
NO.4 BTM.WBT (S)		73.99			103.51	
NO.4 A.W.WBT (P)		80.36			109.88	
NO.4 A.W.WBT (S)		80.36			109.88	
NO.5 BTM.WBT (P)		102.27			131.79	
NO.5 BTM.WBT (S)		102.27			131.79	
NO.5 W.WBT (P)		96.30			125.82	
NO.5 W.WBT (S)		96.30			125.82	
NO.6 W.WBT (P)		152.93			182.45	
NO.6 W.WBT (S)		152.93			182.45	
A.P.T. (P)		179.96			209.48	
A.P.T. (S)		180.09			209.48	
ANTI-HEEL.T. (P)		111.63			141.15	
ANTI-HEEL.T. (S)		111.63			141.15	
NO.1 P.W.T. (P)		0.0			0.0	
NO.1 P.W.T. (S)		0.0			0.0	
NO.2 P.W.T.		134.89			164.41	
DIST.W.T.		141.90			171.42	
NO.3 F.W.FOT (P)		36.04			65.56	
NO.3 F.W.FOT (S)		36.04			65.56	
NO.3 A.W.FOT (P)		50.87			80.39	
NO.3 A.W.FOT (S)		50.87			80.39	
DEEP FOT (P)		123.81			153.33	
DEEP FOT (S)		124.63			154.15	
H.F.O.SETT.T. (P)		122.37			151.89	
H.F.O.SETT.T. (S)		122.33			151.85	
H.F.O.SERV.T.		122.41			151.93	
D.O.T. (P)		128.07			157.59	
D.O.T. (S)		131.13			160.65	
D.O.SETT.T.		129.10			158.62	
D.O.SERV.T.		129.08			158.60	

(1)=TOTAL WEIGHT	(2)=TOTAL MOMENT	(1)	(2)	(1)	(2) 4344212.
(3)=DISPLACEMENT		(3)		(3)	
(4)=TRIM		(4)		(4)	
(5)=∂ (TABLE 1)		(5)		(5)	
(6)=δ∂(TABLE 2)		(6)		(6)	
(7)=(6)*(4)		(7)		(7)	
(8)=(5)+(7)		(8)		(8)	
(9)=(8)*(3)		(9)		(9)	
(10)= W'		(10) 13950.		(10) 15241.	
SF=(10)+(1)-(9)		SF=		SF=	
	(11)=δb(TABLE 3)		(11)		(11)
	(12)=(4)*(11)		(12)		(12)
	(13)=b (TABLE 4)		(13)		(13)
	(14)=(13)+(12)		(14)		(14)
	(15)=(14)*(3)		(15)		(15)
	(16)= M'		(16) 1409520.		(16) 1841634.
	BM=(16)+(2)-(15)		BM=		BM=

TRIM BY THE STERN .... + HOG MOMENT .... +
TRIM BY THE HEAD .... - SAG MOMENT .... -

6

BENDING MOMENT AND SHEAR FORCE CALCULATION SHEET

COND. NO.	BHD.NO. 9 FR.NO. 287		
ITEM	W (MT)	ℓ (M)	M=W*ℓ
CONSTANT	295	125.78	37071
NO.1 HOLD		30.96	
NO.2 HOLD		60.02	
NO.3 HOLD		88.52	
NO.4 HOLD		118.39	
NO.5 HOLD		148.27	
NO.6 HOLD		206.42	
ON NO.1 HATCH(F&A)		30.01	
ON NO.2 HATCH(F&A)		59.35	
ON NO.3 HATCH(F&A)		88.87	
ON NO.4 HATCH(F&A)		118.40	
ON NO.5 HATCH(F&A)		148.39	
ON DECK (ROW13-14)		176.39	
ON NO.6 HATCH(F&A)		207.49	
ON DECK (ROW17-18)		229.24	
DEEP WBT		0.0	
NO.1 BTM.WBT		31.39	
NO.2 F.WBT (P)		52.42	
NO.2 F.WBT (S)		52.42	
NO.2 A.WBT (P)		67.29	
NO.2 A.WBT (S)		67.25	
NO.3 BTM.WBT (P)		90.75	
NO.3 BTM.WBT (S)		90.75	
NO.4 F.W.WBT (P)		111.31	
NO.4 F.W.WBT (S)		111.31	
NO.4 BTM.WBT (P)		119.68	
NO.4 BTM.WBT (S)		119.68	
NO.4 A.W.WBT (P)		126.05	
NO.4 A.W.WBT (S)		126.05	
NO.5 BTM.WBT (P)		147.96	
NO.5 BTM.WBT (S)		147.96	
NO.5 W.WBT (P)		141.99	
NO.5 W.WBT (S)		141.99	
NO.6 W.WBT (P)		198.62	
NO.6 W.WBT (S)		198.62	
A.P.T. (P)		225.65	
A.P.T. (S)		225.78	
ANTI-HEEL.T. (P)		157.32	
ANTI-HEEL.T. (S)		157.32	
NO.1 P.W.T. (P)		10.87	
NO.1 P.W.T. (S)		10.87	
NO.2 P.W.T.		180.58	
DIST.W.T.		187.59	
NO.3 F.W.FOT (P)		81.73	
NO.3 F.W.FOT (S)		81.73	
NO.3 A.W.FOT (P)		96.56	
NO.3 A.W.FOT (S)		96.56	
DEEP FOT (P)		169.50	
DEEP FOT (S)		170.32	
H.F.O.SETT.T. (P)		168.06	
H.F.O.SETT.T. (S)		168.02	
H.F.O.SERV.T.		168.10	
D.O.T. (P)		173.76	
D.O.T. (S)		176.82	
D.O.SETT.T.		174.79	
D.O.SERV.T.		174.77	

(1)=TOTAL WEIGHT	(2)=TOTAL MOMENT	(1)	(2)
(3)=DISPLACEMENT		(3)	
(4)=TRIM		(4)	
(5)=∂ (TABLE 1)		(5)	
(6)=δ∂(TABLE 2)		(6)	
(7)=(6)*(4)		(7)	
(8)=(5)+(7)		(8)	
(9)=(8)*(3)		(9)	
(10)= W'		(10) 16470.	
SF=(10)+(1)-(9)		SF=	
	(11)=δb(TABLE 3)		(11)
	(12)=(4)*(11)		(12)
	(13)=b (TABLE 4)		(13)
	(14)=(13)+(12)		(14)
	(15)=(14)*(3)		(15)
	(16)= M'		(16) 2097809.
	BM=(16)+(2)-(15)		BM=

TRIM BY THE STERN .... + HOG MOMENT .... +
TRIM BY THE HEAD .... - SAG MOMENT .... -

7

3 - 4 CALCULATION SHEETS (NUMERICAL EXAMPLE) ~ FOR COND. NO. 1

BENDING MOMENT AND SHEAR FORCE CALCULATION SHEET

COND. NO. 1	BHD.NO. 1 FR.NO. 12			BHD.NO. 2 FR.NO. 50		
ITEM	W(MT)	ℓ (M)	M=W*ℓ	W(MT)	ℓ (M)	M=W*ℓ
CONSTANT	22.	7.53	167.	63.	22.03	1393.
NO.1 HOLD	0.	0.0	0.	0.	0.0	0.
NO.2 HOLD	0.	0.0	0.	0.	0.0	0.
NO.3 HOLD	0.	0.0	0.	0.	0.0	0.
NO.4 HOLD	0.	0.0	0.	0.	0.0	0.
NO.5 HOLD	0.	0.0	0.	0.	0.0	0.
NO.6 HOLD	0.	0.0	0.	690.	13.56	9356.
ON NO.1 HATCH(F&A)	0.	0.0	0.	0.	0.0	0.
ON NO.2 HATCH(F&A)	0.	0.0	0.	0.	0.0	0.
ON NO.3 HATCH(F&A)	0.	0.0	0.	0.	0.0	0.
ON NO.4 HATCH(F&A)	0.	0.0	0.	0.	0.0	0.
ON NO.5 HATCH(F&A)	0.	0.0	0.	0.	0.0	0.
ON DECK (ROW13-14)	0.	0.0	0.	0.	0.0	0.
ON NO.6 HATCH(F&A)	0.	0.0	0.	884.	15.10	13348.
ON DECK (ROW17-18)	456.	8.25	3762.	456.	36.85	16804.
DEEP WBT	0.	0.0	0.	0.	0.0	0.
NO.1 BTM.WBT	0.	0.0	0.	0.	0.0	0.
NO.2 F.WBT (P)	0.	0.0	0.	0.	0.0	0.
NO.2 F.WBT (S)	0.	0.0	0.	0.	0.0	0.
NO.2 A.WBT (P)	0.	0.0	0.	0.	0.0	0.
NO.2 A.WBT (S)	0.	0.0	0.	0.	0.0	0.
NO.3 BTM.WBT (P)	0.	0.0	0.	0.	0.0	0.
NO.3 BTM.WBT (S)	0.	0.0	0.	0.	0.0	0.
NO.4 F.W.WBT (P)	0.	0.0	0.	0.	0.0	0.
NO.4 F.W.WBT (S)	0.	0.0	0.	0.	0.0	0.
NO.4 BTM.WBT (P)	0.	0.0	0.	0.	0.0	0.
NO.4 BTM.WBT (S)	0.	0.0	0.	0.	0.0	0.
NO.4 A.W.WBT (P)	0.	0.0	0.	0.	0.0	0.
NO.4 A.W.WBT (S)	0.	0.0	0.	0.	0.0	0.
NO.5 BTM.WBT (P)	0.	0.0	0.	0.	0.0	0.
NO.5 BTM.WBT (S)	0.	0.0	0.	0.	0.0	0.
NO.5 W.WBT (P)	0.	0.0	0.	0.	0.0	0.
NO.5 W.WBT (S)	0.	0.0	0.	0.	0.0	0.
NO.6 W.WBT (P)	0.	0.0	0.	0.	0.0	0.
NO.6 W.WBT (S)	0.	0.0	0.	0.	0.0	0.
A.P.T. (P)	* 0.	0.0	0.	0.	0.0	0.
A.P.T. (S)	* 0.	0.0	0.	0.	0.0	0.
ANTI-HEEL.T. (P)	0.	0.0	0.	0.	0.0	0.
ANTI-HEEL.T. (S)	0.	0.0	0.	0.	0.0	0.
NO.1 P.W.T. (P)	0.	0.0	0.	0.	0.0	0.
NO.1 P.W.T. (S)	0.	0.0	0.	0.	0.0	0.
NO.2 P.W.T.	0.	0.0	0.	0.	0.0	0.
DIST.W.T.	0.	0.0	0.	0.	0.0	0.
NO.3 F.W.FOT (P)	0.	0.0	0.	0.	0.0	0.
NO.3 F.W.FOT (S)	0.	0.0	0.	0.	0.0	0.
NO.3 A.W.FOT (P)	0.	0.0	0.	0.	0.0	0.
NO.3 A.W.FOT (S)	0.	0.0	0.	0.	0.0	0.
DEEP FOT (P)	0.	0.0	0.	0.	0.0	0.
DEEP FOT (S)	0.	0.0	0.	0.	0.0	0.
H.F.O.SETT.T. (P)	0.	0.0	0.	0.	0.0	0.
H.F.O.SETT.T. (S)	0.	0.0	0.	0.	0.0	0.
H.F.O.SERV.T.	0.	0.0	0.	0.	0.0	0.
D.O.T. (P)	0.	0.0	0.	0.	0.0	0.
D.O.T. (S)	0.	0.0	0.	0.	0.0	0.
D.O.SETT.T.	0.	0.0	0.	0.	0.0	0.
D.O.SERV.T.	0.	0.0	0.	0.	0.0	0.

(1)=TOTAL WEIGHT	(2)=TOTAL MOMENT	(1) 478.	(2) 3929.	(1) 2093.	(2) 40901.
(3)=DISPLACEMENT		(3) 37874.		(3) 37874.	
(4)=TRIM (M)		(4) 0.4100		(4) 0.4100	
(5)=∂ (TABLE 1)		(5) 0.0001		(5) 0.0394	
(6)=δ∂(TABLE 2)		(6) 0.0		(6) 0.0049	
(7)=(6)*(4)		(7) 0.0		(7) 0.0020	
(8)=(5)+(7)		(8) 0.0001		(8) 0.0414	
(9)=(8)*(3)		(9) 4.		(9) 1568.	
(10)= W'		(10) 721.		(10) 2213.	
SF=(10)+(1)-(9)		SF= 1195.		SF= 2738.	
	(11)=δD(TABLE3)		(11) 0.0		(11) 0.052
	(12)=(4)*(11)		(12) 0.0		(12) 0.021
	(13)=D (TABLE4)		(13) -0.002		(13) 0.369
	(14)=(13)+(12)		(14) -0.002		(14) 0.390
	(15)=(14)*(3)		(15) -76.		(15) 14771.
	(16)= M'		(16) 5145.		(16) 46020.
	BM=(16)+(2)-(15)		BM= 9150.		BM= 72150.

TRIM BY THE STERN .... + HOG MOMENT .... +
TRIM BY THE HEAD .... - SAG MOMENT .... -

1137

BENDING MOMENT AND SHEAR FORCE CALCULATION SHEET

COND, NO. 1	BHD.NO. 3 FR.NO. 84			BHD.NO. 4 FR.NO.122		
ITEM	W(MT)	ℓ (M)	M=W*ℓ	W(MT)	ℓ (M)	M=W*ℓ
CONSTANT	101.	36.02	3627.	141.	52.17	7376.
NO.1 HOLD	0.	0.0	0.	0.	0.0	0.
NO.2 HOLD	0.	0.0	0.	0.	0.0	0.
NO.3 HOLD	0.	0.0	0.	0.	0.0	0.
NO.4 HOLD	0.	0.0	0.	0.	0.0	0.
NO.5 HOLD	0.	0.0	0.	1770.	14.00	24780.
NO.6 HOLD	690.	40.76	28124.	690.	71.70	49473.
ON NO.1 HATCH(F&A)	0.	0.0	0.	0.	0.0	0.
ON NO.2 HATCH(F&A)	0.	0.0	0.	0.	0.0	0.
ON NO.3 HATCH(F&A)	0.	0.0	0.	0.	0.0	0.
ON NO.4 HATCH(F&A)	0.	0.0	0.	0.	0.0	0.
ON NO.5 HATCH(F&A)	0.	0.0	0.	884.	14.13	12491.
ON DECK (ROW13-14)	538.	10.35	5568.	538.	41.29	22214.
ON NO.6 HATCH(F&A)	884.	42.30	37393.	884.	73.24	64744.
ON DECK (ROW17-18)	456.	64.05	29207.	456.	94.99	43315.
DEEP WBT	0.	0.0	0.	0.	0.0	0.
NO.1 BTM.WBT	0.	0.0	0.	0.	0.0	0.
NO.2 F.WBT (P)	0.	0.0	0.	0.	0.0	0.
NO.2 F.WBT (S)	0.	0.0	0.	0.	0.0	0.
NO.2 A.WBT (P)	0.	0.0	0.	0.	0.0	0.
NO.2 A.WBT (S)	0.	0.0	0.	0.	0.0	0.
NO.3 BTM.WBT (P)	0.	0.0	0.	0.	0.0	0.
NO.3 BTM.WBT (S)	0.	0.0	0.	0.	0.0	0.
NO.4 F.W.WBT (P)	0.	0.0	0.	0.	0.0	0.
NO.4 F.W.WBT (S)	0.	0.0	0.	0.	0.0	0.
NO.4 BTM.WBT (P)	0.	0.0	0.	0.	0.0	0.
NO.4 BTM.WBT (S)	0.	0.0	0.	0.	0.0	0.
NO.4 A.W.WBT (P)	0.	0.0	0.	0.	0.0	0.
NO.4 A.W.WBT (S)	0.	0.0	0.	0.	0.0	0.
NO.5 BTM.WBT (P)	0.	0.0	0.	0.	0.0	0.
NO.5 BTM.WBT (S)	0.	0.0	0.	0.	0.0	0.
NO.5 W.WBT (P)	0.	0.0	0.	0.	0.0	0.
NO.5 W.WBT (S)	0.	0.0	0.	0.	0.0	0.
NO.6 W.WBT (P)	0.	0.0	0.	0.	0.0	0.
NO.6 W.WBT (S)	0.	0.0	0.	0.	0.0	0.
A.P.T. (P)	0.	0.0	0.	0.	0.0	0.
A.P.T. (S)	0.	0.0	0.	0.	0.0	0.
ANTI-HEEL.T. (P)	0.	0.0	0.	0.	0.0	0.
ANTI-HEEL.T. (S)	0.	0.0	0.	0.	0.0	0.
NO.1 P.W.T. (P)	0.	0.0	0.	0.	0.0	0.
NO.1 P.W.T. (S)	0.	0.0	0.	0.	0.0	0.
NO.2 P.W.T.	111.	15.40	1709.	111.	46.34	5144.
DIST.W.T.	31.	22.40	694.	31.	53.34	1654.
NO.3 F.W.FOT (P)	0.	0.0	0.	0.	0.0	0.
NO.3 F.W.FOT (S)	0.	0.0	0.	0.	0.0	0.
NO.3 A.W.FOT (P)	0.	0.0	0.	0.	0.0	0.
NO.3 A.W.FOT (S)	0.	0.0	0.	0.	0.0	0.
DEEP FOT (P)	462.	4.31	1991.	462.	35.25	16285.
DEEP FOT (S)	469.	5.13	2406.	469.	36.07	16917.
H.F.O.SETT.T. (P)	116.	2.87	333.	116.	33.81	3922.
H.F.O.SETT.T. (S)	116.	2.83	328.	116.	33.77	3917.
H.F.O.SERV.T.	120.	2.91	349.	120.	33.85	4062.
D.O.T. (P)	74.	8.57	634.	74.	39.51	2924.
D.O.T. (S)	86.	11.63	1000.	86.	42.57	3661.
D.O.SETT.T.	20.	9.60	192.	20.	40.54	811.
D.O.SERV.T.	20.	9.58	192.	20.	40.52	810.

	BHD.NO. 3	BHD.NO. 4
(1)=TOTAL WEIGHT	(1) 4294.	(1) 6988.
(2)=TOTAL MOMENT	(2) 113747.	(2) 284500.
(3)=DISPLACEMENT	(3) 37874.	(3) 37874.
(4)=TRIM (M)	(4) 0.4100	(4) 0.4100
(5)=d (TABLE 1)	(5) 0.1667	(5) 0.3720
(6)=δd(TABLE 2)	(6) 0.0109	(6) 0.0148
(7)=(6)*(4)	(7) 0.0045	(7) 0.0061
(8)=(5)+(7)	(8) 0.1712	(8) 0.3781
(9)=(8)*(3)	(9) 6484.	(9) 14320.
(10)= W'	(10) 6743.	(10) 8624.
SF=(10)+(1)-(9)	SF= 4553.	SF= 1292.
(11)=δD(TABLE3)	(11) 0.270	(11) 0.676
(12)=(4)*(11)	(12) 0.111	(12) 0.277
(13)=D (TABLE4)	(13) 3.004	(13) 11.250
(14)=(13)+(12)	(14) 3.115	(14) 11.527
(15)=(14)*(3)	(15) 117978.	(15) 436574.
(16)= M'	(16) 169871.	(16) 407608.
BM=(16)+(2)-(15)	BM= 165640.	BM= 255534.

TRIM BY THE STERN .... + HOG MOMENT .... +
TRIM BY THE HEAD .... - SAG MOMENT .... -

BENDING MOMENT AND SHEAR FORCE CALCULATION SHEET

COND, NO. 1	BHD.NO. 5 FR.NO.158			BHD.NO. 6 FR.NO.194		
ITEM	W(MT)	ℓ (M)	M=W*ℓ	W(MT)	ℓ (M)	M=W*ℓ
CONSTANT	178.	67.85	12100.	213.	83.79	17887.
NO.1 HOLD	0.	0.0	0.	0.	0.0	0.
NO.2 HOLD	0.	0.0	0.	0.	0.0	0.
NO.3 HOLD	0.	0.0	0.	1796.	14.38	25826.
NO.4 HOLD	1920.	14.12	27110.	1920.	43.64	83789.
NO.5 HOLD	1770.	43.52	77030.	1770.	73.04	129281.
NO.6 HOLD	690.	101.22	69842.	690.	130.74	90211.
ON NO.1 HATCH(F&A)	0.	0.0	0.	0.	0.0	0.
ON NO.2 HATCH(F&A)	0.	0.0	0.	0.	0.0	0.
ON NO.3 HATCH(F&A)	0.	0.0	0.	884.	13.67	12084.
ON NO.4 HATCH(F&A)	884.	13.66	12075.	884.	43.18	38171.
ON NO.5 HATCH(F&A)	884.	43.65	38587.	884.	73.17	64682.
ON DECK (ROW13-14)	538.	70.81	38096.	538.	100.33	53978.
ON NO.6 HATCH(F&A)	884.	102.76	90840.	884.	132.28	116936.
ON DECK (ROW17-18)	456.	124.51	56777.	456.	154.03	70238.
DEEP WBT	0.	0.0	0.	0.	0.0	0.
NO.1 BTM.WBT	0.	0.0	0.	0.	0.0	0.
NO.2 F.WBT (P)	0.	0.0	0.	0.	0.0	0.
NO.2 F.WBT (S)	0.	0.0	0.	0.	0.0	0.
NO.2 A.WBT (P)	0.	0.0	0.	0.	0.0	0.
NO.2 A.WBT (S)	0.	0.0	0.	0.	0.0	0.
NO.3 BTM.WBT (P)	0.	0.0	0.	0.	0.0	0.
NO.3 BTM.WBT (S)	0.	0.0	0.	0.	0.0	0.
NO.4 F.W.WBT (P)	0.	0.0	0.	0.	0.0	0.
NO.4 F.W.WBT (S)	0.	0.0	0.	0.	0.0	0.
NO.4 BTM.WBT (P)	0.	0.0	0.	0.	0.0	0.
NO.4 BTM.WBT (S)	0.	0.0	0.	0.	0.0	0.
NO.4 A.W.WBT (P)	0.	0.0	0.	0.	0.0	0.
NO.4 A.W.WBT (S)	0.	0.0	0.	0.	0.0	0.
NO.5 BTM.WBT (P)	0.	0.0	0.	0.	0.0	0.
NO.5 BTM.WBT (S)	0.	0.0	0.	0.	0.0	0.
NO.5 W.WBT (P)	0.	0.0	0.	0.	0.0	0.
NO.5 W.WBT (S)	0.	0.0	0.	0.	0.0	0.
NO.6 W.WBT (P)	0.	0.0	0.	0.	0.0	0.
NO.6 W.WBT (S)	0.	0.0	0.	0.	0.0	0.
A.P.T. (P)	0.	0.0	0.	0.	0.0	0.
A.P.T. (S)	0.	0.0	0.	0.	0.0	0.
ANTI-HEEL.T. (P)	0.	0.0	0.	0.	0.0	0.
ANTI-HEEL.T. (S)	0.	0.0	0.	0.	0.0	0.
NO.1 P.W.T. (P)	0.	0.0	0.	0.	0.0	0.
NO.1 P.W.T. (S)	0.	0.0	0.	0.	0.0	0.
NO.2 P.W.T.	111.	75.86	8420.	111.	105.38	11697.
DIST.W.T.	31.	82.86	2569.	31.	112.38	3484.
NO.3 F.W.FOT (P)	0.	0.0	0.	450.	6.52	2934.
NO.3 F.W.FOT (S)	0.	0.0	0.	450.	6.52	2934.
NO.3 A.W.FOT (P)	0.	0.0	0.	548.	21.35	11700.
NO.3 A.W.FOT (S)	0.	0.0	0.	548.	21.35	11700.
DEEP FOT (P)	462.	64.77	29924.	462.	94.29	43562.
DEEP FOT (S)	469.	65.59	30762.	469.	95.11	44607.
H.F.O.SETT.T. (P)	116.	63.33	7346.	116.	92.85	10771.
H.F.O.SETT.T. (S)	116.	63.29	7342.	116.	92.81	10766.
H.F.O.SERV.T.	120.	63.37	7604.	120.	92.89	11147.
D.O.T. (P)	74.	69.03	5108.	74.	98.55	7293.
D.O.T. (S)	86.	72.09	6200.	86.	101.61	8738.
D.O.SETT.T.	20.	70.06	1401.	20.	99.58	1992.
D.O.SERV.T.	20.	70.04	1401.	20.	99.56	1991.

	BHD.NO. 5	BHD.NO. 6
(1)=TOTAL WEIGHT	(1) 9829.	(1) 14540.
(2)=TOTAL MOMENT	(2) 530534.	(2) 888399.
(3)=DISPLACEMENT	(3) 37874.	(3) 37874.
(4)=TRIM (M)	(4) 0.4100	(4) 0.4100
(5)=d (TABLE 1)	(5) 0.5772	(5) 0.7655
(6)=δd(TABLE 2)	(6) 0.0154	(6) 0.0128
(7)=(6)*(4)	(7) 0.0063	(7) 0.0052
(8)=(5)+(7)	(8) 0.5835	(8) 0.7707
(9)=(8)*(3)	(9) 22099.	(9) 29189.
(10)= W'	(10) 10419.	(10) 12214.
SF=(10)+(1)-(9)	SF= -1851.	SF= -2435.
(11)=δD(TABLE3)	(11) 1.129	(11) 1.553
(12)=(4)*(11)	(12) 0.463	(12) 0.637
(13)=D (TABLE4)	(13) 25.270	(13) 45.168
(14)=(13)+(12)	(14) 25.733	(14) 45.805
(15)=(14)*(3)	(15) 974611.	(15) 1734818.
(16)= M'	(16) 688691.	(16) 1022757.
BM=(16)+(2)-(15)	BM= 244614.	BM= 176338.

TRIM BY THE STERN .... + HOG MOMENT .... +
TRIM BY THE HEAD .... - SAG MOMENT .... -

BENDING MOMENT AND SHEAR FORCE CALCULATION SHEET

COND, NO. 1	BHD.NO. 7 FR.NO.230			BHD.NO. 8 FR.NO.266		
ITEM	W(MT)	ℓ (M)	M=W*ℓ	W(MT)	(M)	M=W*ℓ
CONSTANT	247.	100.03	24686.	278.	116.58	32440.
NO.1 HOLD	0.	0.0	0.	660.	15.80	10428.
NO.2 HOLD	1800.	16.10	28980.	1800.	45.62	82116.
NO.3 HOLD	1796.	43.90	78844.	1796.	73.42	131862.
NO.4 HOLD	1920.	73.16	140467.	1920.	102.68	197146.
NO.5 HOLD	1770.	102.56	181531.	1770.	132.08	233782.
NO.6 HOLD	690.	160.26	110580.	690.	189.78	130949.
ON NO.1 HATCH(F&A)	0.	0.0	0.	908.	13.86	12585.
ON NO.2 HATCH(F&A)	908.	13.86	12585.	908.	43.38	39389.
ON NO.3 HATCH(F&A)	884.	43.19	38180.	884.	72.71	64276.
ON NO.4 HATCH(F&A)	884.	72.70	64267.	884.	102.22	90362.
ON NO.5 HATCH(F&A)	884.	102.69	90778.	884.	132.21	116874.
ON DECK (ROW13-14)	538.	129.85	69859.	538.	159.37	85741.
ON NO.6 HATCH(F&A)	884.	161.80	143032.	884.	191.32	169127.
ON DECK (ROW17-18)	456.	183.55	83699.	456.	213.07	97160.
DEEP WBT	0.	0.0	0.	0.	0.0	0.
NO.1 BTM.WBT	0.	0.0	0.	1565.	15.22	23819.
NO.2 F.WBT (P)	0.	0.0	0.	0.	0.0	0.
NO.2 F.WBT (S)	0.	0.0	0.	0.	0.0	0.
NO.2 A.WBT (P)	0.	0.0	0.	0.	0.0	0.
NO.2 A.WBT (S)	0.	0.0	0.	0.	0.0	0.
NO.3 BTM.WBT (P)	0.	0.0	0.	0.	0.0	0.
NO.3 BTM.WBT (S)	0.	0.0	0.	0.	0.0	0.
NO.4 F.W.WBT (P)	0.	0.0	0.	0.	0.0	0.
NO.4 F.W.WBT (S)	0.	0.0	0.	0.	0.0	0.
NO.4 BTM.WBT (P)	0.	0.0	0.	0.	0.0	0.
NO.4 BTM.WBT (S)	0.	0.0	0.	0.	0.0	0.
NO.4 A.W.WBT (P)	0.	0.0	0.	0.	0.0	0.
NO.4 A.W.WBT (S)	0.	0.0	0.	0.	0.0	0.
NO.5 BTM.WBT (P)	0.	0.0	0.	0.	0.0	0.
NO.5 BTM.WBT (S)	0.	0.0	0.	0.	0.0	0.
NO.5 W.WBT (P)	0.	0.0	0.	0.	0.0	0.
NO.5 W.WBT (S)	0.	0.0	0.	0.	0.0	0.
NO.6 W.WBT (P)	0.	0.0	0.	0.	0.0	0.
NO.6 W.WBT (S)	0.	0.0	0.	0.	0.0	0.
A.P.T. (P)	0.	0.0	0.	0.	0.0	0.
A.P.T. (S)	0.	0.0	0.	0.	0.0	0.
ANTI-HEEL.T. (P)	0.	0.0	0.	0.	0.0	0.
ANTI-HEEL.T. (S)	0.	0.0	0.	0.	0.0	0.
NO.1 P.W.T. (P)	0.	0.0	0.	0.	0.0	0.
NO.1 P.W.T. (S)	0.	0.0	0.	0.	0.0	0.
NO.2 P.W.T.	111.	134.90	14974.	111.	164.42	18251.
DIST.W.T.	31.	141.90	4399.	31.	171.42	5314.
NO.3 F.W.FOT (P)	450.	36.04	16218.	450.	65.56	29502.
NO.3 F.W.FOT (S)	450.	36.04	16218.	450.	65.56	29502.
NO.3 A.W.FOT (P)	548.	50.87	27877.	548.	80.39	44054.
NO.3 A.W.FOT (S)	548.	50.87	27877.	548.	80.39	44054.
DEEP FOT (P)	462.	123.81	57200.	462.	153.33	70838.
DEEP FOT (S)	469.	124.63	58451.	469.	154.15	72296.
H.F.O.SETT.T. (P)	116.	122.37	14195.	116.	151.89	17619.
H.F.O.SETT.T. (S)	116.	122.33	14190.	116.	151.85	17615.
H.F.O.SERV.T.	120.	122.41	14689.	120.	151.93	18232.
D.O.T. (P)	74.	128.07	9477.	74.	157.59	11662.
D.O.T. (S)	86.	131.13	11277.	86.	160.65	13816.
D.O.SETT.T.	20.	129.10	2582.	20.	158.62	3172.
D.O.SERV.T.	20.	129.08	2582.	20.	158.60	3172.

	BHD.NO. 7	BHD.NO. 8
(1)=TOTAL WEIGHT	(1) 17262.	(1) 20446.
(2)=TOTAL MOMENT	(2) 1359694.	(2) 1917155.
(3)=DISPLACEMENT	(3) 37874.	(3) 37874.
(4)=TRIM (M)	(4) 0.4100	(4) 0.4100
(5)=d (TABLE 1)	(5) 0.9028	(5) 0.9744
(6)=δd(TABLE 2)	(6) 0.0078	(6) 0.0030
(7)=(6)*(4)	(7) 0.0032	(7) 0.0012
(8)=(5)+(7)	(8) 0.9060	(8) 0.9756
(9)=(8)*(3)	(9) 34314.	(9) 36950.
(10)= W'	(10) 13950.	(10) 15241.
SF=(10)+(1)-(9)	SF= -3082.	SF= -1263.
(11)=δD(TABLE3)	(11) 1.861	(11) 2.015
(12)=(4)*(11)	(12) 0.763	(12) 0.826
(13)=D (TABLE4)	(13) 69.951	(13) 97.799
(14)=(13)+(12)	(14) 70.714	(14) 98.625
(15)=(14)*(3)	(15) 2678221.	(15) 3735323.
(16)= M'	(16) 1409520.	(16) 1841634.
BM=(16)+(2)-(15)	BM= 90993.	BM= 23466.

TRIM BY THE STERN .... + HOG MOMENT .... +
TRIM BY THE HEAD .... - SAG MOMENT .... -

BENDING MOMENT AND SHEAR FORCE CALCULATION SHEET

COND, NO. 1	BHD.NO. 9 FR.NO.287		
ITEM	W(MT)	ℓ (M)	M=W*ℓ
CONSTANT	295.	125.78	37071.
NO.1 HOLD	660.	31.97	21100.
NO.2 HOLD	1800.	61.79	111222.
NO.3 HOLD	1796.	89.59	160904.
NO.4 HOLD	1920.	118.85	228192.
NO.5 HOLD	1770.	148.25	262402.
NO.6 HOLD	690.	205.95	142106.
ON NO.1 HATCH(F&A)	908.	30.03	27267.
ON NO.2 HATCH(F&A)	908.	59.55	54071.
ON NO.3 HATCH(F&A)	884.	88.88	78570.
ON NO.4 HATCH(F&A)	884.	118.39	104657.
ON NO.5 HATCH(F&A)	884.	148.38	131168.
ON DECK (ROW13-14)	538.	175.54	94440.
ON NO.6 HATCH(F&A)	884.	207.49	183422.
ON DECK (ROW17-18)	456.	229.24	104533.
DEEP WBT	0.	0.0	0.
NO.1 BTM.WBT	1565.	31.39	49125.
NO.2 F.WBT (P)	0.	0.0	0.
NO.2 F.WBT (S)	0.	0.0	0.
NO.2 A.WBT (P)	0.	0.0	0.
NO.2 A.WBT (S)	0.	0.0	0.
NO.3 BTM.WBT (P)	0.	0.0	0.
NO.3 BTM.WBT (S)	0.	0.0	0.
NO.4 F.W.WBT (P)	0.	0.0	0.
NO.4 F.W.WBT (S)	0.	0.0	0.
NO.4 BTM.WBT (P)	0.	0.0	0.
NO.4 BTM.WBT (S)	0.	0.0	0.
NO.4 A.W.WBT (P)	0.	0.0	0.
NO.4 A.W.WBT (S)	0.	0.0	0.
NO.5 BTM.WBT (P)	0.	0.0	0.
NO.5 BTM.WBT (S)	0.	0.0	0.
NO.5 W.WBT (P)	0.	0.0	0.
NO.5 W.WBT (S)	0.	0.0	0.
NO.6 W.WBT (P)	0.	0.0	0.
NO.6 W.WBT (S)	0.	0.0	0.
A.P.T. (P)	0.	0.0	0.
A.P.T. (S)	0.	0.0	0.
ANTI-HEEL.T. (P)	0.	0.0	0.
ANTI-HEEL.T. (S)	0.	0.0	0.
NO.1 P.W.T. (P)	117.	10.87	1272.
NO.1 P.W.T. (S)	117.	10.87	1272.
NO.2 P.W.T.	111.	180.59	20045.
DIST.W.T.	31.	187.59	5815.
NO.3 F.W.FOT (P)	450.	81.73	36778.
NO.3 F.W.FOT (S)	450.	81.73	36778.
NO.3 A.W.FOT (P)	548.	96.56	52915.
NO.3 A.W.FOT (S)	548.	96.56	52915.
DEEP FOT (P)	462.	169.50	78309.
DEEP FOT (S)	469.	170.32	79880.
H.F.O.SETT.T. (P)	116.	168.06	19495.
H.F.O.SETT.T. (S)	116.	168.02	19490.
H.F.O.SERV.T.	120.	168.10	20172.
D.O.T. (P)	74.	173.76	12858.
D.O.T. (S)	86.	176.82	15207.
D.O.SETT.T.	20.	174.79	3496.
D.O.SERV.T.	20.	174.77	3495.

	BHD.NO. 9
(1)=TOTAL WEIGHT	(1) 20697.
(2)=TOTAL MOMENT	(2) 2250442.
(3)=DISPLACEMENT	(3) 37874.
(4)=TRIM (M)	(4) 0.4100
(5)=d (TABLE 1)	(5) 0.9918
(6)=δd(TABLE 2)	(6) 0.0017
(7)=(6)*(4)	(7) 0.0007
(8)=(5)+(7)	(8) 0.9925
(9)=(8)*(3)	(9) 37590.
(10)= W'	(10) 16470.
SF=(10)+(1)-(9)	SF= -423.
(11)=δD(TABLE3)	(11) 2.053
(12)=(4)*(11)	(12) 0.842
(13)=D (TABLE4)	(13) 113.714
(14)=(13)+(12)	(14) 114.556
(15)=(14)*(3)	(15) 4338693.
(16)= M'	(16) 2097809.
BM=(16)+(2)-(15)	BM= 9558.

TRIM BY THE STERN .... + HOG MOMENT .... +
TRIM BY THE HEAD .... - SAG MOMENT .... -

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4 - 1 SUMMARY OF LONGITUDINAL STRENGTH CALCULATION
(BY SOPHISTICATED COMPUTER PROGRAM)

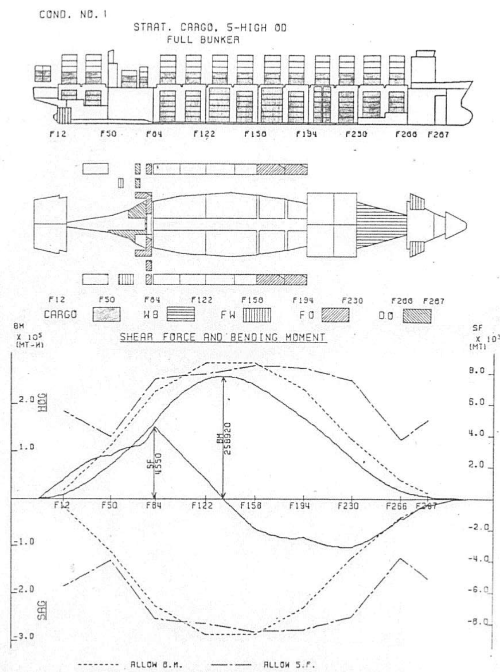
SHEAR FORCE = (MT)
BENDING MOMENT = (MT-M)

COND. NO.		MAXIMUM POSITION	MAXIMUM VALUE	BULKHEAD (FR. NO.) 12	50	84	122	158	194	230	266	287
1	SF	83.0	4550	1183	2717	4511	1249	-1898	-2452	-3069	-1246	-402
	BM	134.8	258920	9087	71694	164330	252460	240063	170722	85226	17683	4190
2	SF	83.0	4136	1183	2883	4127	1236	-1512	-2859	-3137	-1103	-420
	BM	132.4	258320	9044	73216	168655	250930	244404	175598	83307	17279	4287
MAXIMUM ALLOWABLE	SF			3300	3920	7430	7950	8640	8340	7520	3750	5050
	BM			12400	111500	224000	207500	207500	231200	125000	39300	11600

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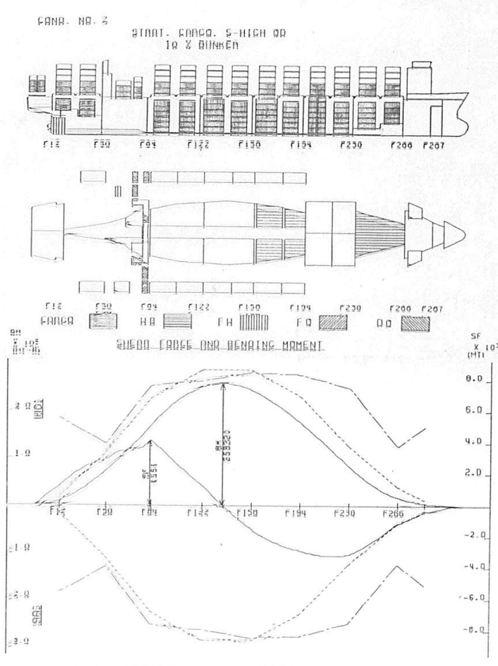
13

4 - 2 BENDING MOMENT AND SHEAR FORCE DIAGRAM



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4 - 3 LOADING AND STABILITY CALCULATION

TS-1

DEPARTURE CALCULATION

Voyage______ Departure Port______ Arrival Port______ Date______

	Weight Tonnes	L.Moment Fwd (MT)	L.Moment Aft (MT)	VCG (M)	V.Moment (MT)	F.S. Moment (MT)
Operating Lightship	17472	------	250244	-----	213418	62
Containers -Sheet TS-2	14982	294581	388223	-	255298	-
Fuel Oil -Sheet TS-3	3279	35186	79406	-	28845	1459
Diesel Oil -Sheet TS-3	200	-	13555	-	838	368
Fresh Water-Sheet TS-3	375	22512	10593	-	6142	457
Salt Water -Sheet TS-4	1565	119119	-	-	6136	-
Misc. Tanks-Sheet TS-4	-	-	-	-	-	-
1. Totals	37873 a	471398 b	742021 c	13.48 d	510677 e	2346 f

DRAFT AND TRIM CALCULATION			STABILITY CALCULATION	
2. Even Keel Draft (Hydrostatics)	8.13		18. Change in KM (Hydrostatics) $0.089 \times \frac{0.41}{2.0}$	0.02
3. L.Mom. for Trim (1c) - (1b) If (-) then F, if (+) then A	270623	F/A		
4. LCG (3) ÷ (1a)	7.15	F/A	19. KM at Even Keel Draft (Hydrostatics)	15.82
5. LCB (Hydrostatics)	6.39	F/A	20. KM Corrected If (9) is (F) then (19)-(18) If (9) is (A) then (19)+(18)	15.84
6. Trim Lever (4) - (5) If (-) the F, if (+) then A	0.76	F/A	21. KG (1d) = (1e) ÷ (1a)	13.48
7. Trim Moment (1a) x (6)	28783		22. GM Uncorrected (20) - (21)	2.36
8. Moment to Trim One Meter (Hydrostatics)	69692		23. F.S. Correction (1f) ÷ (1a)	0.06
9. Trim in Meters (7) ÷ (8)	0.41	F/A	24. GM Corrected (22) - (23)	2.30
			25. GM Required	0.90

		Observed	Port	Stbd	Average
10. Change in Draft Fwd per Meter of Trim (Hydrostatics)	0.52				
11. Draft Change Fwd (9) x (10)	0.21	Draft Fwd			
12. Draft At Fwd Marks If (9) is (F) then (2) + (11) If (9) is (A) then (2) - (11)	7.92				
13. Change in Draft Aft per Meter of Trim (Hydrostatics)	0.47	Draft Aft			
14. Draft Change Aft (9) x (13)	0.19				
15. Draft at Aft Marks If (9) is (F) then (2) - (14) If (9) is (A) then (2) + (14)	8.32	Midship			
16. Mean Draft [(12) + (15)] ÷ 2	8.12	Trim			

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TS-2F

CONTAINER STOWAGE SUMMARY
FOR CONTAINER ROWS FWD OF AMIDSHIP

Voyage__________ Departure Port__________ Arrival Port__________ Date__________

Row	No. Containers			Weight* Tonnes	V.Moment* (MT)	LCG M - ⊠	Fwd L.Moment (MT)
	20's	40's	45's				
1 Above Dk	----	65	----	442	11176	84.95 F	37548 F
	----	----				84.95 F	F
1 Below Dk	----	14	----	210	2876	84.95 F	17840 F
2 Above Dk	10	----	----	46	1152	74.19 F	3413 F
	----	55	----	374	9456	70.36 F	26315 F
	----	----				70.36 F	F
2 Below Dk	----	30	----	450	5796	71.12 F	32004 F
3 Above Dk	10	----	----	46	1152	66.53 F	3060 F
4 Above Dk	----	65	----	442	11176	55.43 F	24500 F
	----	----				55.43 F	F
4 Below Dk	----	40	----	600	7115	55.43 F	33258 F
5 Above Dk	10	----	----	46	1152	44.67 F	2055 F
	----	55	----	374	9456	40.84 F	15274 F
	----	----				40.84 F	F
5 Below Dk	60	----	----	600	7186	44.67 F	26802 F
6 Above Dk	10	----	----	46	1152	37.01 F	1702 F
6 Below Dk	60	----	----	600	7186	37.01 F	22206 F
7 Above Dk	----	65	----	442	11176	25.91 F	11452 F
	----	----				25.91 F	F
7 Below Dk	----	54	----	810	8646	25.91 F	20987 F
8 Above Dk	----	65	----	442	11176	11.32 F	5003 F
	----	----				11.32 F	F
8 Below Dk	----	----	58	986	10580	11.32 F	11162 F
TOTALS FWD	160	508	58	6956	117609		294581 F

* Weight and vertical moment of each row are summed on the Container Stowage Sheets.

LCG's for container stacks aft of amidships are listed on the following page.

TS-2A

CONTAINER STOWAGE SUMMARY
FOR CONTAINER ROWS AFT OF AMIDSHIP

Voyage__________ Departure Port__________ Arrival Port__________ Date__________

Row	No. Containers			Weight* Tonnes	V.Moment* (MT)	LCG M - ⊠	Aft L.Moment (MT)
	20's	40's	45's				
9 Above Dk	----	65	----	442	11176	3.61 A	1596 A
	----	----				3.61 A	A
9 Below Dk	----	60	----	900	9010	3.61 A	3249 A
10 Above Dk	----	65	----	442	11176	18.20 A	8044 A
	----	----				18.20 A	A
10 Below Dk	----	----	60	1020	10690	18.20 A	18564 A
11 Above Dk	----	65	----	442	11176	33.12 A	14639 A
	----	----				33.12 A	A
11 Below Dk	----	60	----	900	9010	33.12 A	29808 A
12 Above Dk	----	65	----	442	11176	48.67 A	21512 A
	----	----				48.67 A	A
12 Below Dk	----	58	----	870	8915	48.67 A	42343 A
13 Above Dk	46	----	----	232	5229	62.54 A	14509 A
14 Above Dk	----	34	----	306	6758	72.23 A	22102 A
15 Above Dk	----	65	----	442	11176	92.88 A	41053 A
	----	----				92.88 A	A
15 Below Dk	----	28	----	420	5819	92.88 A	39010 A
16 Above Dk	----	65	----	442	11176	107.13 A	47351 A
	----	----				107.13 A	A
16 Below Dk	----	18	----	270	4058	107.13 A	28925 A
17 Above Dk	36	----	----	228	5572	118.37 A	26988 A
	----					121.75 A	A
18 Above Dk	36	----	----	228	5572	125.13 A	28530 A
TOTALS AFT	118	648	60	8026	137689		388223 A
TOTALS FWD	160	508	58	6956	117609		294581 F
TOTALS	278	1156	118	14982	255298		

* Weight and vertical moment of each row are summed on the Container Stowage Sheets.

Enter "TOTALS FWD" from the previous sheet.

TS-3

TANK CAPACITIES - FUEL OIL, DIESEL OIL, FRESH WATER Date__________

FUEL OIL (Specific Gravity = 0.9845)

TANK	Weight - Tonnes		LCG	L.Moment		VCG*	V.Moment		Free Surface		
	98%	Actual	(M)	Actual	98%	(M)	Actual	98%	98%	Slack	Actual
NO.3 F.W. F.O.T. P	450.3	450.3	25.76F	11600 F	11,600F	8.57	3859	3,859	22	37	22
NO.3 F.W. F.O.T. S	450.3	450.3	25.76F	11600 F	11,600F	8.57	3859	3,859	22	37	22
NO.3 A.W. F.O.T. P	547.8	547.8	10.94F	5993 F	5,993F	8.78	4810	4,810	27	27	27
NO.3 A.W. F.O.T. S	547.8	547.8	10.94F	5993 F	5,993F	8.78	4810	4,810	27	27	27
Total L.Moment Fwd				35186 F	35,186F						
DEEP F.O.T. P	461.6	461.6	62.01A	28624 A	28,624A	7.88	3637	3,637	5	550	550
DEEP F.O.T. S	469.1	469.1	62.83A	29474 A	29,474A	8.26	3875	3,875	11	552	552
H.F.O. SETT. T. P	116.4	116.4	60.57A	7050 A	7,050A	10.40	1211	1,211	157	157	157
H.F.O. SETT. T. S	115.6	115.6	60.53A	6997 A	6,997A	11.52	1332	1,332	81	81	81
H.F.O. SERV. T.	119.8	119.8	60.61A	7261 A	7,261A	12.12	1452	1,452	21	26	21
Total L.Moment Aft				79406 A	79,406A						
TOTALS	3,279	3279					28845	28,845	373	1,494	1459

DIESEL OIL (Specific Gravity = 0.870)

TANK	Weight - Tonnes		LCG	L.Moment		VCG	V.Moment		Free Surface		
	98%	Actual	(M)	Actual	98%	(M)	Actual	98%	98%	Slack	Actual
DIESEL OIL T. P	73.9	73.9	66.28A	4898 A	4,898A	1.56	115	115	238	267	267
DIESEL OIL T. S	86.1	86.1	69.36A	5972 A	5,972A	1.52	131	131	86	93	93
D.O. SETT. T.	20.1	20.1	67.30A	1353 A	1,353A	13.06	263	263	4	4	4
D.O. SERV. T.	19.8	19.8	67.28A	1332 A	1,332A	16.62	329	329	4	4	4
TOTALS	200	200		13555 A	13,555A		838	838	332	368	368

FRESH WATER (Specific Gravity = 1.000)

TANK	Weight - Tonnes		LCG	L.Moment		VCG	V.Moment		Free Surface	
	100%	Actual	(M)	Actual	100%	(M)	Actual	100%	Slack	Apply
NO.1 POT. W.T. P	116.5	116.5	96.62F	11256 F	11,256F	17.44	2032	2,032	219	219
NO.1 POT. W.T. S	116.5	116.5	96.62F	11256 F	11,256F	17.44	2032	2,032	219	219
Total L.Moment Fwd				22512 F	22,512F					
NO.2 POT. W.T.	111.4	111.4	73.09A	8142 A	8,142A	14.95	1665	1,665	14	14
DIST. W.T.	30.6	30.6	80.10A	2451 A	2,451A	13.51	413	413	5	5
Total L.Moment Aft				10593 A	10,593A					
TOTALS	375	375					6142	6,142	457	457

* Use Tank VCG Tables on page 13. Determine the VCG by rounding off the weight to the next highest 100 tonnes. Interpolation is not necessary.

TS-4

SALT WATER BALLAST, MISCELLANEOUS TANKS Date__________

SALT WATER BALLAST (Specific Gravity = 1.025)

TANK	Weight - Tonnes		LCG	L.Moment		VCG*	V.Moment		Free Surface	
	100%	Actual	(M)	Actual	100%	(M)	Actual	100%	Slack	Apply
DEEP W.B.T.	380.7	0	110.28F	0 F	41,984F		0	3,514	371	0
NO.1 BTM. W.B.T.	1,565.3	1565.3	76.10F	119119 F	119,119F	3.92	6136	6,136	9,422	
NO.2 F. W.B.T. P	565.8	0	55.07F	0 F	31,159F		0	4,028	287	
NO.2 F. W.B.T. S	565.8		55.07F	F	31,159F			4,028	287	
NO.2 A. W.B.T. P	789.1		40.20F	F	31,722F			5,232	1,131	
NO.2 A. W.B.T. S	790.0		40.24F	F	31,790F			5,238	1,138	
NO.3 BTM. W.B.T. P	412.7		16.74F	F	6,909F	0.98		404	2,503	
NO.3 BTM. W.B.T. S	412.7		16.74F	F	6,909F	0.98		404	2,503	
Total L.Moment Fwd				119119 F	300,751F					
NO.4 F.W. W.B.T. P	480.8	0	3.83A	0 A	1,837A		0	4,140	23	0
NO.4 F.W. W.B.T. S	480.8		3.83A	A	1,837A			4,140	23	
NO.4 BTM. W.B.T. P	623.6		12.19A	A	7,602A	0.92		574	4,995	
NO.4 BTM. W.B.T. S	623.6		12.19A	A	7,602A	0.92		574	4,995	
NO.4 A.W. W.B.T. P	605.6		18.56A	A	11,240A			5,184	28	
NO.4 A.W. W.B.T. S	605.6		18.56A	A	11,240A			5,184	28	
NO.5 BTM. W.B.T. P	531.7		40.47A	A	21,518A	0.96		510	3,932	
NO.5 BTM. W.B.T. S	531.7		40.47A	A	21,518A	0.96		510	3,932	
NO.5 WING W.B.T. P	566.6		34.50A	A	19,548A			4,901	27	
NO.5 WING W.B.T. S	566.6		34.50A	A	19,548A			4,901	27	
NO.6 WING W.B.T. P	580.2		91.13A	A	52,874A			5,843	828	
NO.6 WING W.B.T. S	580.2		91.13A	A	52,874A			5,843	828	
AFT PEAK T. P	453.4		118.16A	A	53,574A			5,495	2,982	
AFT PEAK T. S	462.0		118.29A	A	54,650A			5,604	3,115	
ANTI-HEELING T. P	615.9		49.83A	A	30,690A			5,007	158	
ANTI-HEELING T. S	615.9		49.83A	A	30,690A			5,007	158	
Total L.Moment Aft				0 A	398,842A					
TOTALS	14,406	1565					6136	92,401	43,721	0

MISCELLANEOUS TANKS (Specific Gravity = 1.000)

TANK	Weight - Tonnes		LCG	L.Moment		VCG	V.Moment		Free Surface	
	100%	Actual	(M)	Actual	100%	(M)	Actual	100%	Slack	Apply
SOOT CLEAN WATER T.	40.9	0	78.41A	0 A	3,207A	9.57	0	391	9	0
CLEAN DRAIN T.	17.8		78.14A	A	1,391A	1.68		30	6	
WASTE OIL T.	17.8		65.60A	A	1,168A	2.01		36	36	
BILGE T.	62.4		87.13A	A	5,437A	1.41		88	153	
TOTALS	139	0		0 A	11,203A		0	545	204	0

* Use Tank VCG Tables on page 13. Determine the VCG by rounding off the weight to the next highest 100 tonnes. Interpolation is not necessary.

1140

TS-6

ARRIVAL CALCULATION

Voyage________ Departure Port________ Arrival Port________ Date________

Item	Weight Tonnes	L.Moment Fwd (MT)	L.Moment Aft (MT)	VCG (M)	V.Moment (MT)	F.S.M. (MT)
Departure Condition	37873	471398	742021	13.48	510677	2346
±Weight Changes since departure:						
FO Tank No.3 F.W. P	-450	-11600			-3859	-22
FO Tank No.3 F.W. S	-450	-11600			-3859	-22
FO Tank No.3 A.W. P	-548	-5993			-4810	-27
FO Tank No.3 A.W. S	-548	-5993			-4810	-27
FO Tank DEEP P	-316		-19596	7.88	-2490	–
FO Tank DEEP S	-323		-20294	8.26	-2668	–
DO Tank P	-66		-4374	1.56	-103	–
DO Tank S	-78		-5410	1.52	-119	–
DO Tank						
SW Tank No.3 BTM. P	+413	+6909			+404	0
SW Tank No.3 BTM. S	+413	+6909			+404	0
SW Tank						
FW Tank No.1 P.W. P	-105	-10145		17.44	-1831	-
FW Tank No.1 P.W. S	-105	-10145		17.44	-1831	-
FW Tank No.2 P.W.	-100		-7309	14.95	-1495	-
1. Total at Arrival	35610 a	429740 b	685038 c	13.58 d	483610 e	2248 f

Item	Value	Item	Value
2. Even Keel Draft (Hydrostatics)	7.75	18. Change in KM $0.110 \times \frac{0.43}{2.0}$ (Hydrostatics)	0.02
3. L.Mom. for Trim (1c) - (1b) If (-) then F, if (+) then A	255298 F/A		
4. LCG (3) ÷ (1a)	7.17	19. KM at Even Keel Draft (Hydrostatics)	16.03
5. LCB (Hydrostatics)	6.37 F/A		
6. Trim Lever (4) - (5) If (-) then F, if (+) then A	0.80 F/A	20. KM Corrected If (9) is (F) then (19) - (18) If (9) is (A) then (19) + (18)	16.05
7. Trim Moment (1a) x (6)	28488 F/A		
8. Moment to Trim one Meter (Hydrostatics)	66769		
9. Trim in Meters (7) ÷ (8)	0.43 F/A	21. KG (1d) = (1e) ÷ (1a)	13.58
10. Change in Draft Fwd per Meter of Trim (Hydrostatics)	0.52	22. GM uncorrected (20) - (21)	2.47
		23. F.S. Correction (1f) ÷ (1a)	0.06
11. Draft Change Fwd (9) x (10)	0.22	24 GM Corrected (22) - (23)	2.41
12. Draft at Fwd Marks If (9) is (F) then (2) + (11) If (9) is (A) then (2) - (11)	7.53	25. GM Required	1.00
13. Change in Draft Aft per Meter of Trim (Hydrostatics)	0.47		
14. Draft Change Aft (9) x (13)	0.20		
15. Draft at Aft Marks If (9) is (F) then (2) - (14) If (9) is (A) then (2) + (14)	7.95		
16. Mean Draft [(12) + (15)] ÷ 2	7.74		

APPROVAL OF OWNER & REGULATORY BODIES								
ALT. NO.	OWNER		USCG		ABS		USPH	
	DATE	LETTER NO.	DATE	LETTER NO.	DATE	LETTER NO.	DATE	LETTER NO.
ORIGINAL								
REV. A	FEB. 10 1986	DFTS/MES-1147						

SHIPYARD AND SHIP'S NO. & NAME			
MITSUI TAMANO		MITSUBISHI KOBE	
NO.1323	DOCTOR LYKES	NO.1158	JAMES LYKES
NO.1324	ALMERIA LYKES	NO.1159	JOSEPH LYKES
NO.1325	TILLIE LYKES	NO.1164	SOLON TURMAN

MITSUI ENGINEERING & SHIPBUILDING CO., LTD.
TAMANO WORKS
FINISHED PLAN

SHIP DESIGN DEPARTMENT MANAGER
SHIP'S NO. 1325
SHIP'S NAME TILLIE LYKES

CO-ORDINATION SECTION
SEC. CHIEF
ASSIST. CHIEF
CHARGE
STAFF
DATE (TEL)

CROSS CURVES OF STABILITY

JOB NO. TS1323/24/25
JOBCLASSIF. NO.
SCALE
LYKES REF. NO. 290109
MITSUI DRAWING NO. 1102084

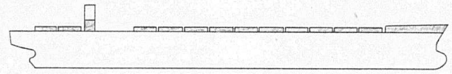
(4 SHEETS WITH COVER)

PLAN RECORD			
ALT. NO.	MARK	ALTERATION/DESCRIPTION	DATE & SIGNATURE
		PREPARED FOR S. NO. 1323 AS FINISHED PLAN, MADE APPLICABLE TO S. NO. 1324 AND S. NO. 1325.	NOV. 10, 1986 K.A. MA

GENERAL NOTES

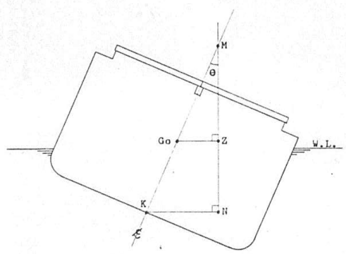
1. Following spaces are assumed to be buoyant.

   F'cle
   Cargo hatches
   Engine casing

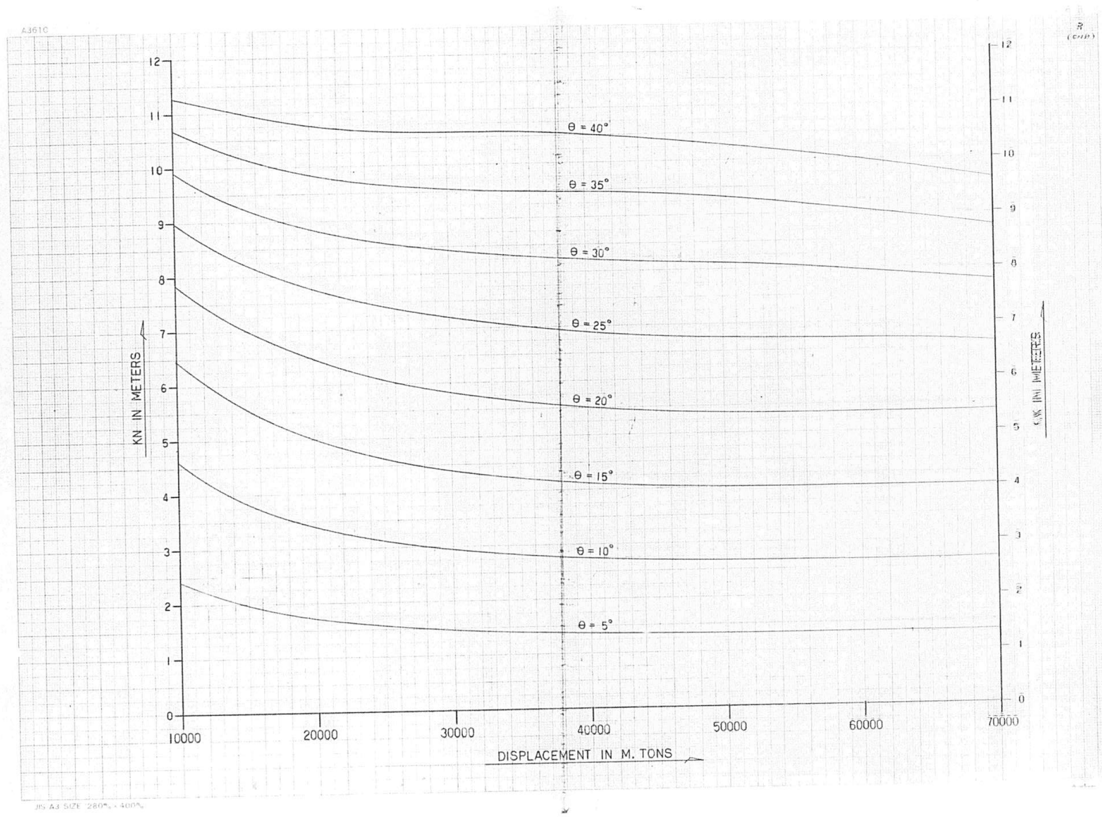


2. VCG (Vertical Center of Gravity) is measured from the top of keel (i.e. base line).

3. The ship is assumed to be afloat even keel.



GoZ = KN - KGo x sin θ
(VCG)



KN IN METERS
DISPLACEMENT IN M. TONS
θ = 40°
θ = 35°
θ = 30°
θ = 25°
θ = 20°
θ = 15°
θ = 10°
θ = 5°
10000
20000
30000
40000
50000
60000
70000

1143

APPROVAL OF OWNER & REGULATORY BODIES								
ALT. NO.	OWNER		USCG		ABS		USPH	
	DATE	LETTER NO.	DATE	LETTER NO.	DATE	LETTER NO.	DATE	LETTER NO.
ORIGINAL								
REV. A	FEB. 10 1986	OFTS/MES-1197						

SHIPYARD AND SHIP'S NO. & NAME			
MITSUI TAMANO		MITSUBISHI KOBE	
NO. 1323	DOCTOR LYKES	NO. 1158	JAMES LYKES
NO. 1324	ALMERIA LYKES	NO. 1159	JOSEPH LYKES
NO. 1325	TILLIE LYKES	NO. 1164	SOLON TURMAN

MITSUI ENGINEERING & SHIPBUILDING CO., LTD.
TAMANO WORKS
FINISHED PLAN

SHIP DESIGN DEPARTMENT MANAGER
SHIP'S NO. 1325
SHIP'S NAME TILLIE LYKES

CO-ORDINATION SECTION

BONJEAN'S TABLE

STAFF
DATE (TEL)
JOB NO. TS1323/24/25
SCALE
LYKES REF. NO. 290111
MITSUI DRAWING NO. 1102086

(3 SHEETS WITH COVER)

PLAN RECORD			
ALT. NO.	MARK	ALTERATION/DESCRIPTION	DATE & SIGNATURE
		PREPARED FOR S. NO. 1323 AS FINISHED PLAN, MADE	NOV. 10, 1986
		APPLICABLE TO S. NO. 1324 AND S. NO. 1325.	K.A. MA

2
(END)

BONJEAN'S TABLE

Area is for full cross sectional area.

(UNIT: M^2)

W.L. (M)	STATION -0.122	0.000 (A.P.)	0.250	0.500	0.750	1.000	1.500	2.000	2.500	3.000	3.500	4.000	4.200	4.500	5.000
4.00	0.00	0.00	0.00	5.83	11.35	16.76	28.79	50.72	82.38	107.08	120.23	125.12	125.22	125.05	121.00
4.50	0.00	0.00	0.00	6.83	13.33	19.62	33.71	62.86	96.95	122.77	136.34	141.23	141.34	141.16	137.11
5.00	0.00	0.00	0.00	7.80	15.33	22.53	40.38	75.67	111.82	138.58	152.45	157.35	157.46	157.28	153.23
5.50	0.00	0.00	0.00	8.76	17.38	25.48	49.04	89.27	127.04	154.55	168.56	173.47	173.57	173.40	169.35
6.00	0.00	0.00	0.00	9.69	19.42	28.47	58.94	103.31	142.46	170.58	184.68	189.59	189.69	189.52	185.47
6.50	0.00	0.00	0.00	10.58	21.33	30.69	70.30	117.85	158.12	186.68	200.80	205.70	205.81	205.64	201.59
7.00	0.00	0.00	0.00	11.46	23.49	34.61	82.47	132.68	173.90	202.79	216.92	221.82	221.93	221.76	217.71
7.50	0.00	0.00	0.00	12.28	25.43	40.12	95.60	147.85	189.84	218.90	233.04	237.94	238.04	237.87	233.82
8.00	0.00	0.00	0.00	13.18	28.59	47.59	109.27	163.21	205.83	235.02	249.16	254.06	254.16	253.99	249.94
8.50	0.00	0.00	0.00	13.42	32.36	57.40	123.57	178.81	221.91	251.14	265.27	270.18	270.28	270.11	266.06
9.00	0.00	0.00	0.00	15.26	38.61	68.42	138.22	194.54	238.00	267.26	281.39	286.30	286.40	286.23	282.18
9.50	0.00	0.00	0.00	18.05	47.89	80.91	153.30	210.43	254.11	283.37	297.51	302.41	302.52	302.34	298.29
10.00	0.00	0.00	0.00	23.73	58.54	94.09	168.60	226.39	270.23	299.49	313.63	318.53	318.64	318.46	314.41
10.50	0.00	0.00	3.60	33.07	70.87	108.10	184.18	242.44	286.35	315.61	329.74	334.65	334.75	334.58	330.53
11.00	0.00	0.20	10.71	43.78	83.93	122.51	199.88	258.52	302.47	331.73	345.86	350.77	350.87	350.70	346.65
11.50	0.16	6.00	20.66	56.20	97.88	137.41	215.73	274.63	318.58	347.85	361.98	366.88	366.99	366.82	362.77
12.00	8.60	14.06	31.85	69.33	112.25	152.56	231.66	290.74	334.70	363.97	378.10	383.00	383.11	382.94	378.89
12.50	18.39	24.98	44.59	83.34	127.12	168.02	247.68	306.85	350.82	380.08	394.22	399.12	399.22	399.05	395.00
13.00	29.45	36.93	57.99	97.76	142.26	183.63	263.74	322.97	366.94	396.20	410.34	415.24	415.34	415.17	411.12
13.50	42.07	50.14	72.19	112.68	157.71	199.43	279.84	339.09	383.06	412.32	426.45	431.36	431.46	431.29	427.24
14.00	55.37	63.93	86.77	127.87	173.33	215.33	295.95	355.21	399.18	428.44	442.57	447.48	447.58	447.41	443.36

W.L. (M)	STATION 5.500	6.000	6.500	7.000	7.500	8.000	8.500	9.000	9.250	9.500	9.750	10.000 (F.P.)	10.163
4.00	111.74	97.32	79.00	59.47	42.22	29.45	20.53	14.00	11.27	8.94	6.98	4.72	1.51
4.50	127.61	112.36	92.55	70.85	51.06	35.86	24.88	16.78	13.42	10.56	8.20	5.59	1.99
5.00	143.57	127.64	106.50	82.75	60.47	42.77	29.58	19.74	15.68	12.22	9.42	6.46	2.47
5.50	159.64	143.22	120.90	95.21	70.48	50.19	34.62	22.88	18.04	13.92	10.66	7.33	2.97
6.00	175.73	158.94	135.59	108.11	80.99	58.09	40.00	26.18	20.50	15.66	11.87	8.17	3.44
6.50	191.85	174.84	150.62	121.48	92.04	66.48	45.73	29.65	23.04	17.43	13.06	8.99	3.91
7.00	207.97	190.81	165.86	135.21	103.55	75.34	51.80	33.30	25.69	19.23	14.22	9.73	4.31
7.50	224.09	206.89	181.36	149.34	115.55	84.67	58.21	37.12	28.43	21.05	15.35	10.42	4.68
8.00	240.21	222.98	197.00	163.75	127.95	94.44	64.99	41.15	31.29	22.92	16.46	11.01	4.94
8.50	256.32	239.09	212.82	178.49	140.78	104.66	72.13	45.37	34.25	24.83	17.53	11.53	5.07
9.00	272.44	255.21	228.73	193.45	153.97	115.30	79.65	49.82	37.37	26.81	18.60	11.92	5.15
9.50	288.56	271.33	244.75	208.68	167.55	126.37	87.54	54.49	40.63	28.85	19.65	12.15	5.15
10.00	304.68	287.45	260.80	224.07	181.43	137.83	95.82	59.45	44.08	31.00	20.73	12.31	5.15
10.50	320.79	303.56	276.90	239.66	195.65	149.71	104.49	64.67	47.70	33.24	21.82	12.37	5.15
11.00	336.91	319.68	293.01	255.37	210.12	161.95	113.58	70.22	51.58	35.65	22.97	12.41	5.15
11.50	353.03	335.80	309.13	271.22	224.88	174.58	123.07	76.08	55.69	38.19	24.17	12.41	5.15
12.00	369.15	351.92	325.25	287.15	239.85	187.55	132.99	82.34	60.13	40.97	25.49	12.41	5.15
12.50	385.27	368.04	341.36	303.18	255.06	200.88	143.33	88.97	64.85	43.94	26.89	12.41	5.15
13.00	401.39	384.16	357.48	319.23	270.44	214.54	154.12	96.06	69.99	47.23	28.50	12.41	5.15
13.50	417.50	400.27	373.60	335.32	286.01	228.53	165.35	103.58	75.50	50.79	30.27	12.51	5.15
14.00	433.62	416.39	389.72	351.43	301.71	242.83	177.06	111.63	81.50	54.77	32.32	12.72	5.15

1144

APPROVAL OF OWNER & REGULATORY BODIES

ALT. NO.	OWNER DATE	OWNER LETTER NO.	USCG DATE	USCG LETTER NO.	ABS DATE	ABS LETTER NO.	USPH DATE	USPH LETTER NO.
ORIGINAL								

FINISHEDPLAN

MITSUI ENGINEERING & SHIPBUILDING CO.,LTD.
TAMANO WORKS

SHIP DESIGN DEPARTMENT MANAGER

CO-ORDINATION SECTION

SHIP'S NO.: 1323 / 1324 / 1325

SHIP'S NAME: PRESIDENT ARTHUR / PRESIDENT BUCHANAN / PRESIDENT GARFIELD

APL MODIFICATION

TRIM AND STABILITY BOOKLET

JOB NO. TS1323/24/25 | SCALE — | LYKES REF. NO. 290112 | MITSUI DRAWING NO. 1102102M

(93 SHEETS WITH COVER)

A

PLAN RECORD

ALT. NO.	MARK	ALTERATION/DESCRIPTION	DATE & SIGNATURE
		PREPARED FOR APL MODIFICATION	FEB. 27, '87 K.A.

B

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1. GENERAL INSTRUCTIONS

A. Introduction

U.S. Coast Guard Regulations, 46 CRF 170.110, require that information be furnished to the Master of U.S. flag cargo ships which "sets forth the stability data necessary to permit efficient handling of the vessel. In general, this information shall be such that the Master can, for any condition of loading, by rapid and simple process, obtain guidance as to the stability of the vessel and determine the freeboard". This booklet fulfills this requirement in a manner consistent with the operating practices of American President Lines.

Sample calculations and forms herein illustrate a standard worksheet procedure developed by APL which simplifies draft computations and consolidates them with the calculation of stability. Separate forms are provided for "Departure", "Daily" and "Arrival" calculations so as to facilitate monitoring change in trim or stability occurring from tankage manipulation during a voyage. Stability (GM) as determined herein should not fall below the "Required GM" values shown on page 16 at any stage of a voyage. These GM requirements are based on the U.S. Coast Guard "weather criteria" and the U.S. Maritime Administration's "damaged stability criteria".

B. Cargo Summaries

Container cargo weights and vertical centers of gravity are figured row by row on the loading forms. These subtotals are then transferred to the Container Summary Sheets and combined to obtain single values of weight and center of gravity for the entire cargo load. Note that different longitudinal centers of gravity (LCG's) are used for 20', 40' or 45' containers, and for deck containers vs hold containers, in the same row.

Consideration should be given to selective stowage of containers with a greater weight toward the bottom of the hold to meet stability requirements. The vertical center of gravity (VCG) of each container is assumed to be 48% of its height. Twenty foot containers are assumed to be 8'-6" high (2.591 meters), forty foot containers are assumed to be 9'-0" high (2.743 meters) and forty-five foot container are assumed to be 9'-6 1/2" high (2.908 meters). Restrictions regarding the stowage of containers are given in the Manual for Container Stowage.

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1. GENERAL INSTRUCTIONS (Cont.)

C. Tank Free Surface

Liquids in partially-filled tanks can move freely as the ship heels or rolls, reducing the ship's effective stability. It is impractical to compute these effects precisely at all stages of a voyage, so certain standard assumptions have been adopted to bracket the possibilities. These are as follows:

1. Small Tanks

The slack free surface moment (FSM) is included in the Operating Lightship. This value is typed on the worksheets to insure its inclusion.

2. Fuel Oil Storage Tanks

a. If considered full : Apply 98% FSM
b. If stripped and verified empty : Apply zero FSM
c. If partially filled : Apply slack FSM

The slack free surface moment should be applied at "Departure" for the largest pair (or pairs) of fuel oil tanks which may be simultaneously slack during the voyage. Apply the "98% slack" value for all other fuel oil tanks considered full at departure; if partially full, apply the "slack" FSM value. Free surface moments need not be applied for fuel oil tanks which remain empty during the entire voyage.

3. Diesel Oil Tanks

Use the same standards applicable to the Fuel Oil Tanks.

4. Fresh Water Tanks

The fresh water tanks are used for a variety of purposes, i.e. distilled water or drinking water. It is very likely that at any time during a voyage the majority of these tanks will be slack. For this reason the combined slack free surface moment of all the fresh water tanks has been entered on the Departure Calculation, Sheet TS-1, as a constant.

5. Salt Water Ballast Tanks

a. If pressed full throughout the voyage : Apply zero FSM
b. If stripped and verified empty throughout the voyage : Apply zero FSM
c. If partially filled throughout the voyage : Apply slack FSM

If ballasting is contemplated during the voyage, apply at Departure and all subsequent conditions, the slack FSM for the pair of tanks (or single, whichever governs) with the greatest free surface effect among the group of tanks.

1. GENERAL INSTRUCTIONS (Cont.)

D. Departure Calculation

Enter the weights and moments of all cargo, consumables and ballast on the Departure Summary, Sheet TS-1. The total weight obtained (on line 1a) is the vessel's displacement, for which the even-keel draft may be read from the Hydrostatic Tables to the nearest hundred tonnes without interpolation. The longitudinal and vertical locations of the center of gravity of the total ship are obtained in lines 4 and 21 by dividing the respective total moments by displacement.

The distance between the vessel's LCG and LCB is the trim lever (line 6). The product of displacement by trim lever (line 7) is the moment causing the vessel to trim. When this moment is divided by the moment to trim one meter (as found from the Hydrostatic Tables) the vessel's total trim in meters as measured between the fore and aft perpendiculars is determined on line 9. When LCG is aft of LCB the vessel trims aft, and vice versa.

The symbol ⊠ means amidships between perpendiculars. Amidships is located .52 meters forward of Fr. 154.

Next, read from the Hydrostatic Tables the change in drafts, at the fore and aft draft marks, per meter of trim, and enter on lines 10 and 13. Multiply the total trim by these values, and add (or subtract) from the even-keel draft to obtain the calculated drafts at the fore and aft draft marks on lines 12 and 15. Compare these calculated values with the draft observations before sailing; if a substantial discrepancy is noted, re-check the calculations.

On the Departure Calculation, a procedure is given on line 18 to adjust the height of the metacenter for trim of the vessel. This adjustment increases KM for trim aft. Next, subtract KG from the adjusted KM to obtain the GM uncorrected for free surface on line 22. The free surface correction is obtained by dividing the total free surface moment (FSM) by the total displacement, and is subtracted from the uncorrected GM to arrive at the corrected GM on line 24.

An available "Corrected GM" which is less than the "Required GM" on line 25 indicates insufficient stability. Such a condition must be coirrected by lowering the VCG of the container cargo as described above, and/or ballasting clean salt water ballast tanks, and/or re-arranging fuel oil tankages. For such conditions the GM calculation should be repeated using as a guide the "Change in Draft and GM for Filling Tanks" table on page 24.

Excessive GM should be avoided to reduce the loads on the deck containers and lashing gear. A reduction in GM may be obtained by reversing the procedure in the previous paragraph.

The "Departure Calculation" form can be used at any stage of a voyage if you wish to build up a new loading condition without reference to a previously calculated condition.

1. GENERAL INSTRUCTIONS (Cont.)

E. Daily Calculation

At sea, use this from as desired to monitor the effects of fuel consumption and ballast transfers. Begin each computation with a known previous condition and then itemize the tankage changes and their individual effects on draft and stability. Use the Trim Table for estimating draft changes; this is close enough for at-sea conditions.

Since the previous condition includes the standard allowance for tank free surface, apply only the changes in free surface to the Daily Calculation. For instance, if a previously-full fuel oil tank has been stripped empty, its 98% FS value may be subtracted out. Or if transfers involving salt water ballast tanks with the largest FSM, previously included at Departure, have been concluded, then the FSM values may be replaced with the next largest tanks.

F. Arrival Condition

Usage of this form should always begin with the Departure Calculation and itemize all changes during the entire voyage, skipping over the Daily Calculations. If prepared before sailing, the Arrival Calculation should incorporate all the standard assumptions regarding tank free surface from (C) above. If prepared just before actual completion of the voyage, however, tank free surface effects should be clearly stated on the worksheet.

Arrival drafts are often critical at certain ports of entry, so the Arrival Calculation provides a more accurate determination of drafts forward and aft, using the same procedure as for calculating Departure drafts. Again, note any observed discrepancies for further refinement.

1. GENERAL INSTRUCTIONS (Cont.)

G. Routine Operating Instructions

1. Not more than one pair fo storage tanks assigned to each type of consumable liquid should be slack at one time.

2. Bilges should be kept pumped to minimum content at all times.

3. Tanks ballasted with salt water to maintain minimum GM requirements shall be carried pressed up at all times while such ballast is necessary, and shall be regularly checked to assure this condition. However, if the vessel is operating with excessive GM, ballast tanks may be partially filled to use the free surface effect to reduce GM. In no case shall this procedure be permitted to result in a GM less than the minimum required to meet weather criteria or damaged stability criteria.

4. During ballasting, a reduction in GM due to slack free surface will occur until the tanks are pressed up. This loss of GM (in meters) is equal to the salt water free surface moment of the tank divided by the vessel's displacement (in tonnes), and is normally accounted for in the calculation procedure described herein.

5. In case of damage to the ship, resulting heel should be corrected by adding ballast. Add ballast one tank at a time. Select tanks which are low in the ship, and which have small free surface effects. Secure valve(s) to damaged tanks.

6. In order to minimize the extent of flooding in the event of damage to the ship, all manual watertight closures shall be secured prior to leaving the dock, and shall remain closed at all times in harbor and at sea. All vents for cargo holds, tanks, and crew access areas are to be maintained in seaworthy condition.

3. GENERAL SHIP'S DESCRIPTION

A. Principal Characteristics

	Official Number	Signal Letters	MES Hull No.	US Tonnage Gross	Net
President Arthur	695901	WGLA	1323	36,799.54	24,112
President Buchanan	697633	WGMJ	1324	36,799.54	24,112
President Garfield	905624	WGXN	1325	36,799.54	24,112

Length Overall	259.0 M
Length Between Perpendiculars	245.000 M
Beam, Maximum, molded	32.200 M
Beam, Maximum	32.282 M
Depth, Main Deck at Side, molded	18.800 M
Depth, Bottom of Keel to Top of Mn. Dk. @ Side	18.882 M
Draft, Keel to Summer Load Line	11.920 M
Freeboard, Summer Load Line to Main Deck Extreme	6.962 M
Displacement at Summer Load Line	62,137 tonnes
Crew	9

B. Machinery

Main Engine : MITSUI B&W 9L80MCE
MCR - 28,800 BHP at 83 PRM

Propeller : 5 blades, 8.100 meters in diameter, 8.317 meter pitch

Generators : (3) Daihatsu 800 KW DG; (1) MES 2000 KW STG;
(1) MHI 800 KW TG

Bow Thruster : Lip's V.B., 2.000 meters in diameter, 920 KW

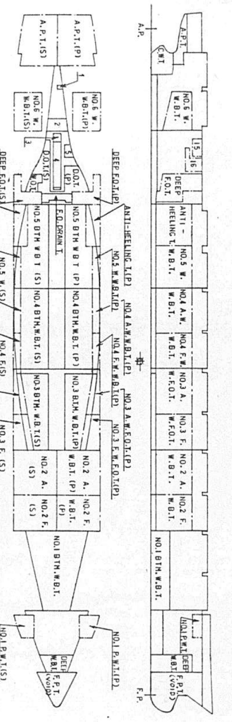
C. Capacities (in tonnes)

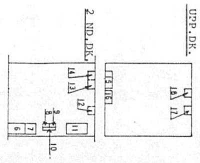
Fuel Oil, 98% full	3,279
Diesel Oil, 98% full	200
Lube Oil, 98% full	146
Fresh Water, 100%	375
Salt Water Ballast, 100%	14,406

Containers

	Maximum 20's			Maximum 40's			Maximum 45's		
	20's	40's	45's	20's	40's	45's	20's	40's	45's
On Deck	158	794	0	46	838	0	46	162	676
In hold	120	362	118	120	362	118	120	362	118
Totals	278	1156	118	166	1200	118	166	524	794

2. GENERAL SHIP'S OUTLINE





NO	TANK NAME	NO	TANK NAME
1	S/T L.O.DRAIN T.	11	H.F.O.SETT.T.(P)
2	BILGE TANK	12	D.O.SETT.T.
3	BTM.RESERVE L.O.T.	13	SOOT CLEAN W.T.
4	BTM.L.O.SUMP.T.	14	DIST.W.T.
5	CLEAN DRAIN T.	15	CYL.O.STOR.T.
6	H.F.O.SETT.T.(S)	16	NO.2 P.W.T.
7	H.F.O.SERV.T.	17	D.O.SERV.T.
8	D.O.SLUDGE T.	18	M/E L.O.STOR.T.
9	H.F.O.SLUDGE T.		
10	L.O.SLUDGE T.		

3. GENERAL SHIP'S DESCRIPTION (Cont.)

E. Allowable Container Stack Weights

Below Deck:

Designed to accommodate following unit weight of containers.

20 Feet	20 LT (20.32 MT)
40 Feet	30 LT (30.48 MT)
45 Feet	32 LT (32.51 MT)

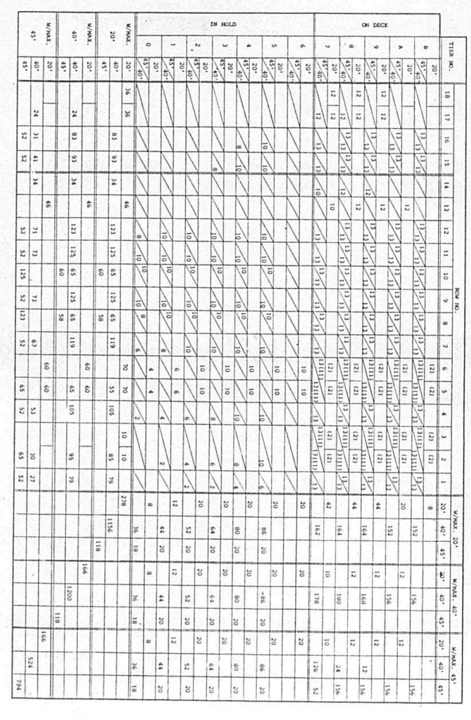
Above Deck:

Allowable stack weight are follows:

45 Feet Containers 1A, 2A, 3A & 4A	96 LT (97.5 MT)
40 Feet Containers 1A, 2A, 3A & 4A	94 LT (95.5 MT)
Other hatches	94 LT (95.5 MT)
Outboard 20 Feet Containers: 1A	60 LT (61.0 MT)
2A	60 LT (61.0 MT)
E/R: Row 13	80 LT (81.3 MT)
Row 14	120 LT (121.9 MT)
Ped: Row 17	90 LT (91.4 MT)

3. GENERAL SHIP'S DESCRIPTION (Cont.)

D. TABLE OF CONTAINER CAPACITY



4. METRIC vs BRITISH CONVERSION FACTORS

Liquid	Assumed Specific Gravity	Tonnes/M^3 or Tonnes 1,000 liters	Cu.Ft./LT	BBL/Tonnes	BBL/LT
Fuel Oil	0.9845	0.9845	36.447	6.389	6.491
Diesel Oil	0.870	0.870	41.243	7.230	7.345
Lube Oil	0.900	0.900	39.869	6.989	7.100
Fresh Water	1.000	1.000	35.881	6.290	6.391
Salt Water	1.025	1.025	35.006	6.136	6.235

WEIGHT

To Convert From	To, Multiply by: Tonnes	Kg	L.Tons	Pounds
Tonnes	1.0	1000	.9842	2204.6
Kg	.001	1.0	.0009842	2.2046
L.Tons	1.016	1016.05	1.0	2240
Pounds	.0004536	.4536	.0004464	1.0

VOLUME

To Convert From	To, Multiply by: M^3	liters	Ft^3	Gallons	Barrels
Cubic Meters	1.0	1,000	35.315	264.17	6.290
Liters	.001	1.0	.035315	.26417	.00629
Cubic Feet	.028317	28.317	1.0	7.4805	.1781
Gallons	.003785	3.7854	.1337	1.0	.02381
Barrels	.1590	.000159	5.6146	42.0	1.0

LENGTH

To Convert From	To, Multiply by: Meters	Centimeters	Millimeters	Feet	Inches
Meters	1.0	100	1,000	3.2808	39.370
Centimeters	.01	1.0	10	.03281	.3937
Millimeters	.001	0.1	1.0	.003281	.03937
Feet	.3048	30.48	304.8	1.0	12.0
Inches	.0254	2.54	25.4	.08333	1.0

5. TANK CAPACITY TABLES

FUEL OIL (Specific Gravity = 0.9845)

Tank	Frames	Volume 100% (M^3)	Weight 98% Full (tonnes)	LCG from ⊠ (M)	VCG (M)	TCG +S -P (M)	Free Surface (M T) 98%	Free Surface (M T) Slack
NO.3 F.W. F.O.T. P	178-194	466.7	450.3	25.76F	8.57	-14.18	22	37
NO.3 F.W. F.O.T. S	178-194	466.7	450.3	25.76F	8.57	14.18	22	37
NO.3 A.W. F.O.T. P	158-178	567.8	547.8	10.94F	8.78	-14.65	27	27
NO.3 A.W. F.O.T. S	158-178	567.8	547.8	10.94F	8.78	14.65	27	27
DEEP F.O.T. P	70-83	468.9*	461.6*	62.01A	7.88	-12.32	5	550
DEEP F.O.T. S	70-83	476.5*	469.1*	62.83A	8.26	12.36	11	552
H.F.O. SETT. T. P	78-83	118.2*	116.4*	60.57A	10.40	-9.49	157	157
H.F.O. SETT. T. S	78-83	117.4*	115.6*	60.53A	11.52	12.69	81	81
H.F.O. SERV. T.	78-83	121.7*	119.8*	60.61A	12.12	7.71	21	26
Subtotals		3,372	3,279	13.49A	8.80	0.43	373	1,494
F.O. DRAIN T.	79-83	56.5	54.5	60.43A	1.07	0.00	116	350
H.F.O. SLUDGE T.	78-80	1.7*	1.7*	61.70A	7.13	1.85	2	2
TOTALS		3,430	3,335	14.28A	8.67	0.42	491	1.846

DIESEL OIL (Specific Gravity = 0.870)

Tank	Frames	Volume 100% (M^3)	Weight 98% Full (tonnes)	LCG from ⊠ (M)	VCG (M)	TCG +S -P (M)	Free Surface (M T) 98%	Free Surface (M T) Slack
DIESEL OIL T. P	66-79	86.7	73.9	66.28A	1.56	-4.70	238	267
DIESEL OIL T. S	54-79	101.0	86.1	69.36A	1.52	3.94	86	93
D.O. SETT. T.	70-74	23.1*	20.1*	67.30A	13.06	-14.75	4	4
D.O. SERV. T.	70-74	22.8*	19.8*	67.28A	16.62	-14.75	4	4
Subtotals		234	200	67.81A	4.19	-2.98	332	368
D.O. SLUDGE T.	78-80	1.5*	1.3*	61.70A	7.13	-0.39	1	1
TOTALS		235	201	67.77A	4.21	-2.97	333	369

LUBE OIL (Specific Gravity = 0.900)

Tank	Frames	Volume 100% (M^3)	Weight 98% Full (tonnes)	LCG from ⊠ (M)	VCG (M)	TCG +S -P (M)	Free Surface (M T) Slack
M/E L.O. STOR. T.	62-66	60.8	53.6	73.70A	15.26	-14.75	5
BTM. RESERVE L.O.T.	51-77	56.6	49.9	74.70A	0.55	0.00	41
BTM. L.O. SUMP. T.	55-76	47.9	42.2	72.53A	1.24	0.00	33
Subtotals		165	146	73.70A	6.16	-5.43	79
L.O. SLUDGE T.	80-82	3.2*	2.9*	60.10A	7.13	0.79	11
S/T L.O. DRAIN T.	29-34	5.9	5.2	98.88A	2.08	0.00	2
CYL.O. STOR. T.	54-62	59.9	52.8	78.50A	17.06	14.75	10
TOTALS		234	207	75.37A	8.86	-0.05	102

Note: The volumes and weights with * mark shows the value to overflow pipe.

5. TANK CAPACITY TABLES (Cont.)

FRESH WATER (Specific Gravity = 1.000)

Tank	Frames	Volume 100% (M^3)	Weight 100% Full (tonnes)	LCG from ⊠ (M)	VCG (M)	TCG +S -P (M)	Free Surface (M T) Slack
NO.1 POT. W.T. P	268-279	116.5	116.5	96.62F	17.44	-10.64	219
NO.1 POT. W.T. S	268-279	116.5	116.5	96.62F	17.44	10.64	219
NO.2 POT. W.T.	58-69	111.4	111.4	73.09A	14.95	14.69	14
DIST. W.T.	54-58	30.6	30.6	80.10A	13.51	-14.75	5
Subtotals		375	375	31.78F	16.38	3.16	457
COOL. W.T.	A.E.-21	90.1	90.1	109.45A	4.60	0.00	11
TOTALS		465	465	4.42F	14.10	2.55	468

SALT WATER BALLAST (Specific Gravity = 1.025)

Tank	Frames	Volume 100% (M^3)	Weight 100% Full (tonnes)	LCG from ⊠ (M)	VCG (M)	TCG +S -P (M)	Free Surface (M T) Slack
DEEP W.B.T.	287-296	371.4	380.7	110.28F	9.23	0.00	371
NO.1 BTM. W.B.T.	230-266	1,527.1	1,565.3	76.10F	3.92	0.00	9,422
NO.2 F. W.B.T. P	214-230	552.0	565.8	55.07F	7.12	-10.07	287
NO.2 F. W.B.T. S	214-230	552.0	565.8	55.07F	7.12	10.07	287
NO.2 A. W.B.T. P	194-214	769.9	789.1	40.20F	6.63	-10.88	1,131
NO.2 A. W.B.T. S	194-214	770.7	790.0	40.24F	6.63	10.87	1,138
NO.3 BTM. W.B.T. P	160-194	402.6	412.7	16.74F	0.98	-7.37	2,503
NO.3 BTM. W.B.T. S	160-194	402.6	412.7	16.74F	0.98	7.37	2,503
NO.4 F.W. W.B.T. P	142-158	469.1	480.8	3.82A	8.61	-14.74	23
NO.4 F.W. W.B.T. S	142-158	469.1	480.8	3.82A	8.61	14.74	23
NO.4 BTM. W.B.T. P	122-158	608.4	623.6	12.19A	0.92	-8.94	4,995
NO.4 BTM. W.B.T. S	122-158	608.4	623.6	12.19A	0.92	8.94	4,995
NO.4 A.W. W.B.T. P	122-142	590.8	605.6	18.56A	8.56	-14.75	28
NO.4 A.W. W.B.T. S	122-142	590.8	605.6	18.56A	8.56	14.75	28
NO.5 BTM. W.B.T. P	84-122	518.7	531.7	40.47A	0.96	-8.12	3,932
NC.5 BTM. W.B.T. S	84-122	518.7	531.7	40.47A	0.96	8.12	3,932
NC.5 WING W.B.T. P	103-122	552.8	566.6	34.50A	8.65	-14.73	27
NO.5 WING W.B.T. S	103-122	552.8	566.6	34.50A	8.65	14.73	27
NO.6 WING W.B.T. P	31-50	566.0	580.2	91.13A	10.07	-11.29	828
NO.6 WING W.B.T. S	31-50	566.0	580.2	91.13A	10.07	11.29	828
AFT PEAK T. P	A.E.-16	442.3	453.4	118.16A	12.12	-5.65	2,982
AFT PEAK T. S	A.E.-16	450.7	462.0	118.29A	12.13	5.56	3,115
ANTI-HEELING T. P	84-103	600.9	615.9	49.83A	8.13	-14.21	158
ANTI-HEELING T. S	84-103	600.9	615.9	49.83A	8.13	14.21	158
TOTALS		14,055	14,406	6.81A	6.41	0.00	43,721

MISCELLANEOUS TANKS (Specific Gravity = 1.000)

Tank	Frames	Volume 100% (M^3)	Weight 100% Full (tonnes)	LCG from ⊠ (M)	VCG (M)	TCG +S -P (M)	Free Surface (M T) Slack
SOOT CLEAN WATER T.	54-62	40.9	40.9	78.41A	9.57	-14.53	9
CLEAN DRAIN T.	54-62	17.8	17.8	78.14A	1.68	-3.54	6
WASTE OIL T.	70-78	17.8	17.8	65.60A	2.01	7.78	36
BILGE T.	44-50	62.4	62.4	87.13A	1.41	0.00	153
TOTALS		139	139	80.65A	3.92	-3.74	204

6. TANK VCG TABLES

VCG(meters) vs Capacity (tonnes)

	Fuel Oil				Salt Water Ballast											
Sp.Grav.	0.9845				1.025											
tonnes	NO.3 F.W. F.O.T. P/S	NO.3 A.W. F.O.T. P/S	DEEP F.O.T. P	DEEP F.O.T. S	DEEP W.B.T.	NO.1 BTM. W.B.T.	NO.2 F. W.B.T. P/S	NO.2 A. W.B.T. P	NO.2 A. W.B.T. S	NO.4 F.W. W.B.T. P/S	NO.4 A.W. W.B.T. P/S	NO.5 WING W.B.T. P/S	NO.6 WING W.B.T. P/S	AFT PEAK T. P	AFT PEAK T. S	ANTI-HEEL. T. P/S
0	1.80	1.80	0.32	0.32	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	4.24	8.50	8.50	1.80
100	3.21	3.28	3.00	3.00	3.61	0.68	1.15	0.64	0.64	3.30	2.93	3.15	6.83	10.77	10.77	2.71
200	4.72	4.55	4.32	4.32	5.96	1.05	2.33	1.08	1.07	4.70	4.05	4.34	7.56	11.25	11.25	3.50
300	6.22	5.75	5.43	5.43	7.92	1.35	3.54	1.76	1.75	6.09	5.16	5.52	8.11	11.63	11.61	4.53
400	7.70	6.93	6.79	6.89	--	1.62	4.77	2.57	2.56	7.48	6.27	6.69	8.71	11.96	11.94	5.64
500	--	8.09	--	--	--	1.85	6.17	3.50	3.48	--	7.39	7.87	9.39	--	--	6.78
600	--	--	--	--	--	2.07	--	4.56	4.55	--	8.50	--	--	--	--	7.94
700	--	--	--	--	--	2.28	--	5.65	5.64	--	--	--	--	--	--	--
800	--	--	--	--	--	2.47	--	--	--	--	--	--	--	--	--	--
900	--	--	--	--	--	2.65	--	--	--	--	--	--	--	--	--	--
1,000	--	--	--	--	--	2.83	--	--	--	--	--	--	--	--	--	--
1,100	--	--	--	--	--	3.01	--	--	--	--	--	--	--	--	--	--
1,200	--	--	--	--	--	3.20	--	--	--	--	--	--	--	--	--	--
1,300	--	--	--	--	--	3.40	--	--	--	--	--	--	--	--	--	--
1,400	--	--	--	--	--	3.59	--	--	--	--	--	--	--	--	--	--
1,500	--	--	--	--	--	3.79	--	--	--	--	--	--	--	--	--	--
98% Wgt	450	548	--	--	--	--	--	--	--	--	--	--	--	--	--	--
100% Wgt	459	559	462*	469*	381	1,565	566	789	790	481	606	567	580	453	462	616
100% VCG	8.57	8.78	7.88*	8.26*	9.23	3.92	7.12	6.63	6.63	8.61	8.56	8.65	10.07	12.12	12.13	8.13

*mark shows the value to overfrow pipe.

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7. OPERATING LIGHTSHIP

	Weight (tonnes)	VCG (M)	V.Moment (M*T)	LCG (M)	L.Moment (M*T)	FSM (M*T)
*Lightship	17,171	12.14	208,456	14.30A	245,545A	33
Crew and Effects	10	27.00	270	99.80F	998F	-
Stores and Misc.	50	18.50	925	84.80F	4240F	-
Spares	20	16.30	326	73.50A	1,470A	-
Provisions	15	17.30	260	95.10F	1,427F	-
Container Lashing Gear	77	15.50	1,194	2.50A	193A	-
Oil & Water in Small Tks	129	15.40	1,987	75.20A	9,701A	29
TOTALS	17,472	12.21	213,418	14.32A	250,244A	62

* Based on the results of the Stability Test conducted onboard the MV "Doctor Lykes" (Now President Arthur) on March 6, 1986 at MES Shipyards, Tamano, Japan, which was approved by ABS as per letter dated Apr. 11, 1986.
USCG deadweight survey were conducted by MES for identical sister vessels MV "Almeria Lykes" (Now President Buchanan) and MV "Tillie Lykes" (Now President Garfield) on May 30 and Oct. 7, 1986 respectively. ABS accepted to use the same fugures after modification for those vessels. (TLX of ABS to MES dated Feb. 9, 1987)

8. Required GM's

The required GM curves on page 16 are based on a formula from the U.S. Coast Guard Regulations for Cargo and Miscellaneous Vessels, 46 CFR 170.170 and U.S. Maritime Administrations damage stability criteria.

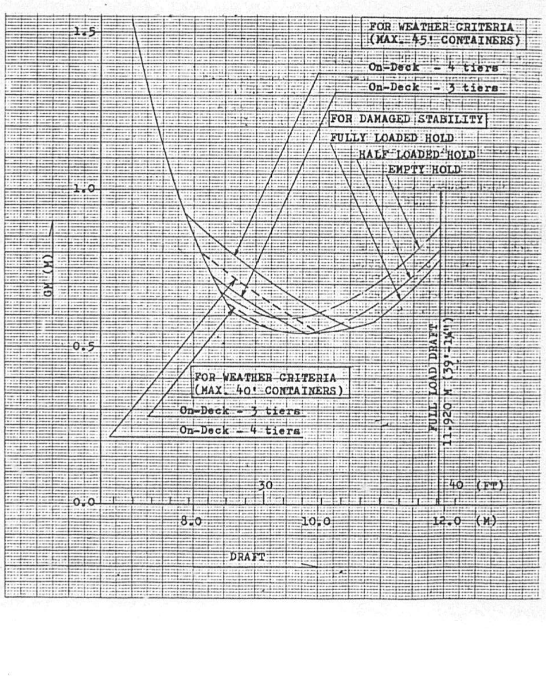
The GM values are net amounts, after deduction for free surface.

It is the Master's responsibility to assure that the vessel always maintains a positive GM at least equal to that required for damage stability or wind heel (weather criteria), whichever is the greater. Since the required GM curve for damage stability is higher than the required wind heel curve for no containers on deck, or for 1 or 2 tiers of containers on deck, the value of the damage stability curve must be used for these loadings. When 3 or 4 tiers of containers on deck are carried, the required GM to be used for stability calculations shall be that which has the highest value between the Damage Stability Curve and Weather Criteria Curve at the given displacement.

The Weather Criteria Curves are drawn for two (2) cases i.e. for Max. 45 FT containers and Max. 40 FT containers assuming each 3 and 4 tiers on deck. When calculating stability, the curve corresponding to the highest tier of containers on deck carried in any row shall be used.
If only 20 FT or 40 FT containers are carried on deck, then the curve for Max. 40 FT containers may be used. In this case, if the number of containers high vary from row to row, the required GM may be calculated using the calculation sheet (page 71) and the Adjustment Factors given on page 17 to 23 instead of the curve for the highest tier in any row.

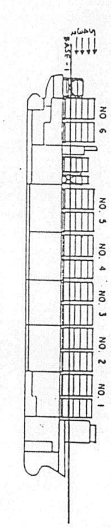
REQUIRED GM CURVES

Based on USCG 46 CFR 170.170 and U.S. maritime Administration's stability criteria.



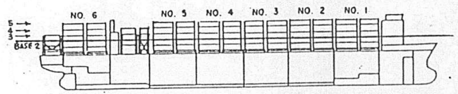
ADJUSTMENT FACTORS FOR REQUIRED GMt IN METERS WITH

BASE CONDITION - 1 HIGH



DRAFT IN METERS	BASE COND GMt REQ'D IN METERS	P TAN θ X DISPL.	NO. OF TIERS ON IN ROW	HOLD NO. 1		HOLD NO. 2		HOLD NO. 3		HOLD NO. 4		HOLD NO. 5		OVER ENG. RM.		HOLD NO. 6		OVER MOORING STATION
				ROW 1 (40')	ROW 2 (40')	ROW 4 (40')	ROW 5 (40')	ROW 7 (40')	ROW 8 (40')	ROW 9 (40')	ROW 10 (40')	ROW 11 (40')	ROW 12 (40')	ROW 13 (20')	ROW 14 (40')	ROW 15 (40')	ROW 16 (40')	ROW 17 (40')
6.5	.72	.01264	2	.6817	.6817	.6817	.6817	.6817	.6817	.6817	.6817	.6817	.6817	.3073	.6185	.6817	.6817	.7038
			3	1.4452	1.4452	1.4452	1.4452	1.4452	1.4452	1.4452	1.4452	1.4452	1.4452	.6554	1.2189	1.4452	1.4452	1.4894
			4	2.2906	2.2906	2.2906	2.2906	2.2906	2.2906	2.2906	2.2906	2.2906	2.2906	1.0440	2.1012	2.2906	2.2906	-
			5	3.2176	3.2176	3.2176	3.2176	3.2176	3.2176	3.2176	3.2176	3.2176	3.2176	-	-	3.2176	3.2176	-
7.0	.64	.01152	2	.6738	.6738	.6738	.6738	.6738	.6738	.6738	.6738	.6738	.6738	.3034	.6106	.6738	.6738	.6959
			3	1.4294	1.4294	1.4294	1.4294	1.4294	1.4294	1.4294	1.4294	1.4294	1.4294	.6475	1.3031	1.4294	1.4294	1.4736
			4	2.2669	2.2669	2.2669	2.2669	2.2669	2.2669	2.2669	2.2669	2.2669	2.2669	1.0323	2.0775	2.2669	2.2669	-
			5	3.1861	3.1861	3.1861	3.1861	3.1861	3.1861	3.1861	3.1861	3.1861	3.1861	-	-	3.1861	3.1861	-
7.5	.57	.01056	2	.6659	.6659	.6659	.6659	.6659	.6659	.6659	.6659	.6659	.6659	.2995	.6027	.6659	.6659	.6880
			3	1.4136	1.4136	1.4136	1.4136	1.4136	1.4136	1.4136	1.4136	1.4136	1.4136	.6396	1.2873	1.4136	1.4136	1.4578
			4	2.2432	2.2432	2.2432	2.2432	2.2432	2.2432	2.2432	2.2432	2.2432	2.2432	1.0205	2.0538	2.2432	2.2432	-
			5	3.1545	3.1545	3.1545	3.1545	3.1545	3.1545	3.1545	3.1545	3.1545	3.1545	-	-	3.1545	3.1545	-
8.0	.51	.009736	2	.6580	.6580	.6580	.6580	.6580	.6580	.6580	.6580	.6580	.6580	.2956	.5949	.6580	.6580	.6801
			3	1.3978	1.3978	1.3978	1.3978	1.3978	1.3978	1.3978	1.3978	1.3978	1.3978	.6318	1.2716	1.3978	1.3978	1.4420
			4	2.2195	2.2195	2.2195	2.2195	2.2195	2.2195	2.2195	2.2195	2.2195	2.2195	1.0086	2.0300	2.2195	2.2195	-
			5	3.1229	3.1229	3.1229	3.1229	3.1229	3.1229	3.1229	3.1229	3.1229	3.1229	-	-	3.1229	3.1229	-
8.5	.46	.009015	2	.6501	.6501	.6501	.6501	.6501	.6501	.6501	.6501	.6501	.6501	.2916	.5870	.6501	.6501	.6722
			3	1.3820	1.3820	1.3820	1.3820	1.3820	1.3820	1.3820	1.3820	1.3820	1.3820	.6239	1.2558	1.3820	1.3820	1.4262
			4	2.1958	2.1958	2.1958	2.1958	2.1958	2.1958	2.1958	2.1958	2.1958	2.1958	.9970	2.0064	2.1958	2.1958	-
			5	3.0913	3.0913	3.0913	3.0913	3.0913	3.0913	3.0913	3.0913	3.0913	3.0913	-	-	3.0913	3.0913	-

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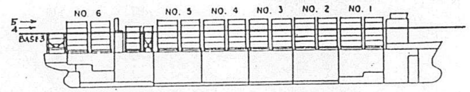


ADJUSTMENT FACTORS FOR REQUIRED GMt IN METERS WITH

BASE CONDITION - 2 HIGH

DRAFT IN METERS	BASE COND GMt REQ'D IN METERS	P TAN θ X DISPL.	NO. OF TIERS OD IN ROW	HOLD NO. 1		HOLD NO. 2		HOLD NO. 3		HOLD NO. 4		HOLD NO. 5		OVER ENG. RM.		HOLD NO. 6		OVER MOORING STATION
				ROW 1 (40')	ROW 2 (40')	ROW 4 (40')	ROW 5 (40')	ROW 7 (40')	ROW 8 (40')	ROW 9 (40')	ROW 10 (40')	ROW 11 (40')	ROW 12 (40')	ROW 13 (20')	ROW 14 (40')	ROW 15 (40')	ROW 16 (40')	ROW 17 (40')
6.5	.85	.01264	3	.7635	.7635	.7635	.7635	.7635	.7635	.7635	.7635	.7635	.7635	.3480	.7004	.7635	.7635	.7856
			4	1.6088	1.6088	1.6088	1.6088	1.6088	1.6088	1.6088	1.6088	1.6088	1.6088	.7367	1.4826	1.6088	1.6088	– –
			5	2.5360	2.5360	2.5360	2.5360	2.5360	2.5360	2.5360	2.5360	2.5360	2.5360	-	-	2.5360	2.5360	-
7.0	.75	.01152	3	.7556	.7556	.7556	.7556	.7556	.7556	.7556	.7556	.7556	.7556	.3441	.6925	.7556	.7556	.7777
			4	1.5930	1.5930	1.5930	1.5930	1.5930	1.5930	1.5930	1.5930	1.5930	1.5930	.7288	1.4668	1.5930	1.5930	-
			5	2.5123	2.5123	2.5123	2.5123	2.5123	2.5123	2.5123	2.5123	2.5123	2.5123	-	-	2.5123	2.5123	-
7.5	.67	.01056	3	.7477	.7477	.7477	.7477	.7477	.7477	.7477	.7477	.7477	.7477	.3402	.6846	.7477	.7477	.7698
			4	1.5772	1.5772	1.5772	1.5772	1.5772	1.5772	1.5772	1.5772	1.5772	1.5772	.7210	1.4510	1.5772	1.5772	-
			5	2.4886	2.4886	2.4886	2.4886	2.4886	2.4886	2.4886	2.4886	2.4886	2.4886	-	-	2.4886	2.4886	-
8.0	.60	.009736	3	.7398	.7398	.7398	.7398	.7398	.7398	.7398	.7398	.7398	.7398	.3362	.6767	.7398	.7398	.7619
			4	1.5615	1.5615	1.5615	1.5615	1.5615	1.5615	1.5615	1.5615	1.5615	1.5615	.7131	1.4352	1.5615	1.5615	-
			5	2.4650	2.4650	2.4650	2.4650	2.4650	2.4650	2.4650	2.4650	2.4650	2.4650	-	-	2.4650	2.4650	-
8.5	.54	.009015	3	.7319	.7319	.7319	.7319	.7319	.7319	.7319	.7319	.7319	.7319	.3323	.6688	.7319	.7319	.7540
			4	1.5457	1.5457	1.5457	1.5457	1.5457	1.5457	1.5457	1.5457	1.5457	1.5457	.7053	1.4914	1.5457	1.5457	-
			5	2.4413	2.4413	2.4413	2.4413	2.4413	2.4413	2.4413	2.4413	2.4413	2.4413	-	-	2.4413	2.4413	-
9.0	.49	.008381	3	.7240	.7240	.7240	.7240	.7240	.7240	.7240	.7240	.7240	.7240	.3284	.6609	.7240	.7240	.7461
			4	1.5299	1.5299	1.5299	1.5299	1.5299	1.5299	1.5299	1.5299	1.5299	1.5299	.6974	1.4036	1.5299	1.5299	-
			5	2.4176	2.4176	2.4176	2.4176	2.4176	2.4176	2.4176	2.4176	2.4176	2.4176	-	-	2.4176	2.4176	-

DRAFT IN METERS	BASE COND GMt REQ'D IN METERS	P TAN θ X DISPL.	NO. OF TIERS OD IN ROW	HOLD NO. 1		HOLD NO. 2		HOLD NO. 3		HOLD NO. 4		HOLD NO. 5		OVER ENG. RM.		HOLD NO. 6		OVER MOORING STATION
				ROW 1 (40')	ROW 2 (40')	ROW 4 (40')	ROW 5 (40')	ROW 7 (40')	ROW 8 (40')	ROW 9 (40')	ROW 10 (40')	ROW 11 (40')	ROW 12 (40')	ROW 13 (20')	ROW 14 (40')	ROW 15 (40')	ROW 16 (40')	ROW 17 (40')
9.0	.42	.008381	2	.6422	.6422	.6422	.6422	.6422	.6422	.6422	.6422	.6422	.6422	.2877	.5791	.6422	.6422	.6643
			3	1.3662	1.3662	1.3662	1.3662	1.3662	1.3662	1.3662	1.3662	1.3662	1.3662	.6161	1.2400	1.3662	1.3662	1.4104
			4	2.1721	2.1721	2.1721	2.1721	2.1721	2.1721	2.1721	2.1721	2.1721	2.1721	.9852	1.9828	2.1721	2.1721	-
			5	3.0598	3.0598	3.0598	3.0598	3.0598	3.0598	3.0598	3.0598	3.0598	3.0598	-	-	3.0598	3.0598	-
9.5	.38	.007821	2	.6343	.6343	.6343	.6343	.6343	.6343	.6343	.6343	.6343	.6343	.2838	.5712	.6343	.6343	.6564
			3	1.3504	1.3504	1.3504	1.3504	1.3504	1.3504	1.3504	1.3504	1.3504	1.3504	.6083	1.2242	1.3504	1.3504	1.3947
			4	2.1484	2.1484	2.1484	2.1484	2.1484	2.1484	2.1484	2.1484	2.1484	2.1484	.9734	1.9591	2.1484	2.1484	-
			5	3.0282	3.0282	3.0282	3.0282	3.0282	3.0282	3.0282	3.0282	3.0282	3.0282	-	-	3.0282	3.0282	-
10.0	.34	.007320	2	.6264	.6264	.6264	.6264	.6264	.6264	.6264	.6264	.6264	.6264	.2799	.5632	.6264	.6264	.6485
			3	1.3347	1.3347	1.3347	1.3347	1.3347	1.3347	1.3347	1.3347	1.3347	1.3347	.6004	1.2084	1.3347	1.3347	1.3789
			4	2.1248	2.1248	2.1248	2.1248	2.1248	2.1248	2.1248	2.1248	2.1248	2.1248	.9617	1.9354	2.1248	2.1248	-
			5	2.9966	2.9966	2.9966	2.9966	2.9966	2.9966	2.9966	2.9966	2.9966	2.9966	-	-	2.9966	2.9966	-
10.29	.32	.007090	2	.6219	.6219	.6219	.6219	.6219	.6219	.6219	.6219	.6219	.6219	.2776	.5587	.6219	.6219	.6440
			3	1.3255	1.3255	1.3255	1.3255	1.3255	1.3255	1.3255	1.3255	1.3255	1.3255	.5959	1.1989	1.3255	1.3255	1.3697
			4	2.1110	2.1110	2.1110	2.1110	2.1110	2.1110	2.1110	2.1110	2.1110	2.1110	.9548	1.9216	2.1110	2.1110	-
			5	2.9783	2.9783	2.9783	2.9783	2.9783	2.9783	2.9783	2.9783	2.9783	2.9783	-	-	2.9783	2.9783	-
10.5	.31	.006871	2	.6185	.6185	.6185	.6185	.6185	.6185	.6185	.6185	.6185	.6185	.2760	.5554	.6185	.6185	.6406
			3	1.3189	1.3189	1.3189	1.3189	1.3189	1.3189	1.3189	1.3189	1.3189	1.3189	.5926	1.1926	1.3189	1.3189	1.3631
			4	2.1011	2.1011	2.1011	2.1011	2.1011	2.1011	2.1011	2.1011	2.1011	2.1011	.9499	1.9117	2.1011	2.1011	-
			5	2.9650	2.9650	2.9650	2.9650	2.9650	2.9650	2.9650	2.9650	2.9650	2.9650	-	-	2.9650	2.9650	-
11.0	.29	.006539	2	.6106	.6106	.6106	.6106	.6106	.6106	.6106	.6106	.6106	.6106	.2720	.5475	.6106	.6106	.6327
			3	1.3031	1.3031	1.3031	1.3031	1.3031	1.3031	1.3031	1.3031	1.3031	1.3031	.5847	1.1768	1.3031	1.3031	1.3473
			4	2.0642	2.0642	2.0642	2.0642	2.0642	2.0642	2.0642	2.0642	2.0642	2.0642	.9381	1.8880	2.0642	2.0642	-
			5	2.9334	2.9334	2.9334	2.9334	2.9334	2.9334	2.9334	2.9334	2.9334	2.9334	-	-	2.9334	2.9334	-
11.5	.28	.006704	2	.6027	.6027	.6027	.6027	.6027	.6027	.6027	.6027	.6027	.6027	.2681	.5396	.6027	.6027	.6249
			3	1.2873	1.2873	1.2873	1.2873	1.2873	1.2873	1.2873	1.2873	1.2873	1.2873	.5769	1.1610	1.2873	1.2873	1.3315
			4	2.0537	2.0537	2.0537	2.0537	2.0537	2.0537	2.0537	2.0537	2.0537	2.0537	.9263	1.8643	2.0537	2.0537	-
			5	2.9019	2.9019	2.9019	2.9019	2.9019	2.9019	2.9019	2.9019	2.9019	2.9019	-	-	2.9019	2.9019	-
11.92	.28	.006780	2	.5961	.5961	.5961	.5961	.5961	.5961	.5961	.5961	.5961	.5961	.2648	.5330	.5961	.5961	.6182
			3	1.2740	1.2740	1.2740	1.2740	1.2740	1.2740	1.2740	1.2740	1.2740	1.2740	.5703	1.1478	1.2740	1.2740	1.3182
			4	2.0338	2.0338	2.0338	2.0338	2.0338	2.0338	2.0338	2.0338	2.0338	2.0338	.9165	1.8444	2.0338	2.0338	-
			5	2.8753	2.8753	2.8753	2.8753	2.8753	2.8753	2.8753	2.8753	2.8753	2.8753	-	-	2.8753	2.8753	-



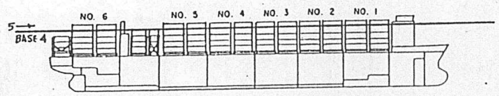
ADJUSTMENT FACTORS FOR REQUIRED GMt IN METERS WITH

BASE CONDITION - 3 HIGH

DRAFT IN METERS	BASE COND GMt REQ'D IN METERS	P TAN θ X DISPL.	NO. OF TIERS OD IN ROW	HOLD NO. 1		HOLD NO. 2		HOLD NO. 3		HOLD NO. 4		HOLD NO. 5		OVER ENG. RM.		HOLD NO. 6		OVER MOORING STATION
				ROW 1 (40')	ROW 2 (40')	ROW 4 (40')	ROW 5 (40')	ROW 7 (40')	ROW 8 (40')	ROW 9 (40')	ROW 10 (40')	ROW 11 (40')	ROW 12 (40')	ROW 13 (20')	ROW 14 (40')	ROW 15 (40')	ROW 16 (40')	ROW 17 (40')
6.5	.99	.01264	4	.8454	.8454	.8454	.8454	.8454	.8454	.8454	.8454	.8454	.8454	.3887	.7822	.8454	.8454	-
			5	1.7725	1.7725	1.7725	1.7725	1.7725	1.7725	1.7725	1.7725	1.7725	1.7725	-	-	1.7725	1.7725	– -
7.0	.88	.01152	4	.8374	.8374	.8374	.8374	.8374	.8374	.8374	.8374	.8374	.8374	.3847	.7743	.8374	.8374	-
			5	1.7567	1.7567	1.7567	1.7567	1.7567	1.7567	1.7567	1.7567	1.7567	1.7567	-	-	1.7567	1.7567	-
7.5	.79	.01056	4	.8296	.8296	.8296	.8296	.8296	.8296	.8296	.8296	.8296	.8296	.3808	.7664	.8296	.8296	-
			5	1.7410	1.7410	1.7410	1.7410	1.7410	1.7410	1.7410	1.7410	1.7410	1.7410	-	-	1.7410	1.7410	-
8.0	.71	.009736	4	.8217	.8217	.8217	.8217	.8217	.8217	.8217	.8217	.8217	.8217	.3769	.7585	.8217	.8217	-
			5	1.7251	1.7251	1.7251	1.7251	1.7251	1.7251	1.7251	1.7251	1.7251	1.7251	-	-	1.7251	1.7251	-
8.5	.64	.009015	4	.8138	.8138	.8138	.8138	.8138	.8138	.8138	.8138	.8138	.8138	.3730	.7506	.8138	.8138	-
			5	1.7094	1.7094	1.7094	1.7094	1.7094	1.7094	1.7094	1.7094	1.7094	1.7094	-	-	1.7094	1.7094	-
9.0	.58	.008381	4	.8059	.8059	.8059	.8059	.8059	.8059	.8059	.8059	.8059	.8059	.3690	.7427	.8059	.8059	-
			5	1.6936	1.6936	1.6936	1.6936	1.6936	1.6936	1.6936	1.6936	1.6936	1.6936	-	-	1.6936	1.6936	-
9.5	.53	.007821	4	.7980	.7980	.7980	.7980	.7980	.7980	.7980	.7980	.7980	.7980	.3651	.7348	.7980	.7980	-
			5	1.6778	1.6778	1.6778	1.6778	1.6778	1.6778	1.6778	1.6778	1.6778	1.6778	-	-	1.6778	1.6778	-
10.0	.48	.007320	4	.7901	.7901	.7901	.7901	.7901	.7901	.7901	.7901	.7901	.7901	.3612	.3612	.7901	.7901	-
			5	1.6620	1.6620	1.6620	1.6620	1.6620	1.6620	1.6620	1.6620	1.6620	1.6620	-	-	1.6620	1.6620	-

DRAFT IN METERS	BASE COND GMt REQ'D IN METERS	P TAN θ X DISPL.	NO. OF TIERS OD IN ROW	HOLD NO. 1		HOLD NO. 2		HOLD NO. 3		HOLD NO. 4		HOLD NO. 5		OVER ENG. RM.		HOLD NO. 6		OVER MOORING STATION
				ROW 1 (40')	ROW 2 (40')	ROW 4 (40')	ROW 5 (40')	ROW 7 (40')	ROW 8 (40')	ROW 9 (40')	ROW 10 (40')	ROW 11 (40')	ROW 12 (40')	ROW 13 (20')	ROW 14 (40')	ROW 15 (40')	ROW 16 (40')	ROW 17 (40')
9.5	.45	.007821	3	.7161	.7161	.7161	.7161	.7161	.7161	.7161	.7161	.7161	.7161	.3245	.6530	.7161	.7161	.7383
			4	1.5141	1.5141	1.5141	1.5141	1.5141	1.5141	1.5141	1.5141	1.5141	1.5141	.6896	1.3878	1.5141	1.5141	-
			5	2.3939	2.3939	2.3939	2.3939	2.3939	2.3939	2.3939	2.3939	2.3939	2.3939	-	-	2.3939	2.3939	-
10.0	.41	.007320	3	.7083	.7083	.7083	.7083	.7083	.7083	.7083	.7083	.7083	.7083	.3206	.6451	.7083	.7083	.7304
			4	1.4983	1.4983	1.4983	1.4983	1.4983	1.4983	1.4983	1.4983	1.4983	1.4983	.6817	1.3720	1.4983	1.4983	-
			5	2.3702	2.3702	2.3702	2.3702	2.3702	2.3702	2.3702	2.3702	2.3702	2.3702	-	-	2.3702	2.3702	-
10.29	.39	.007090	3	.7037	.7037	.7037	.7037	.7037	.7037	.7037	.7037	.7037	.7037	.3183	.6405	.7037	.7037	.7258
			4	1.4891	1.4891	1.4891	1.4891	1.4891	1.4891	1.4891	1.4891	1.4891	1.4891	.6772	1.3629	1.4891	1.4891	--
			5	2.3565	2.3565	2.3565	2.3565	2.3565	2.3565	2.3565	2.3565	2.3565	2.3565	-	-	2.3565	2.3565	-
10.5	.37	.006871	3	.7004	.7004	.7004	.7004	.7004	.7004	.7004	.7004	.7004	.7004	.3166	.6372	.7004	.7004	.7225
			4	1.4825	1.4825	1.4825	1.4825	1.4825	1.4825	1.4825	1.4825	1.4825	1.4825	.6739	1.3563	1.4825	1.4825	-
			5	2.3465	2.3465	2.3465	2.3465	2.3465	2.3465	2.3465	2.3465	2.3465	2.3465	-	-	2.3465	2.3465	-
11.0	.35	.006539	3	.6925	.6925	.6925	.6925	.6925	.6925	.6925	.6925	.6925	.6925	.3127	.6293	.6925	.6925	.7146
			4	1.4825	1.4825	1.4825	1.4825	1.4825	1.4825	1.4825	1.4825	1.4825	1.4825	.6661	1.3405	1.4825	1.4825	-
			5	2.3465	2.3465	2.3465	2.3465	2.3465	2.3465	2.3465	2.3465	2.3465	2.3465	-	-	2.3465	2.3465	-
11.5	.34	.006704	3	.6846	.6846	.6846	.6846	.6846	.6846	.6846	.6846	.6846	.6846	.3088	.6214	.6846	.6846	.7067
			4	1.4509	1.4509	1.4509	1.4509	1.4509	1.4509	1.4509	1.4509	1.4509	1.4509	.6582	1.3247	1.4509	1.4509	-
			5	2.2992	2.2992	2.2992	2.2992	2.2992	2.2992	2.2992	2.2992	2.2992	2.2992	-	-	2.2992	2.2992	-
11.92	.33	.006780	3	.6783	.6783	.6783	.6783	.6783	.6783	.6783	.6783	.6783	.6783	.3055	.6148	.6783	.6783	.7000
			4	1.4377	1.4377	1.4377	1.4377	1.4377	1.4377	1.4377	1.4377	1.4377	1.4377	.6516	1.3114	1.4377	1.4377	-
			5	2.2793	2.2793	2.2793	2.2793	2.2793	2.2793	2.2793	2.2793	2.2793	2.2793	-	-	2.2793	2.2793	-

DRAFT IN METERS	BASE COND GMt REQ'D IN METERS	P TAN θ X DISPL.	NO. OF TIERS OD IN ROW	HOLD NO. 1		HOLD NO. 2		HOLD NO. 3		HOLD NO. 4		HOLD NO. 5		OVER ENG. RM.		HOLD NO. 6		OVER MOORING STATION
				ROW 1 (40')	ROW 2 (40')	ROW 4 (40')	ROW 5 (40')	ROW 7 (40')	ROW 8 (40')	ROW 9 (40')	ROW 10 (40')	ROW 11 (40')	ROW 12 (40')	ROW 13 (20')	ROW 14 (40')	ROW 15 (40')	ROW 16 (40')	ROW 17 (40')
10.29	.46	.007090	4	.7855	.7855	.7855	.7855	.7855	.7855	.7855	.7855	.7855	.7855	.3589	.7223	.7855	.7855	-
			5	1.6528	1.6528	1.6528	1.6528	1.6528	1.6528	1.6528	1.6528	1.6528	1.6528	-	-	1.6528	1.6528	-
10.5	.44	.006871	4	.7822	.7822	.7822	.7822	.7822	.7822	.7822	.7822	.7822	.7822	.3572	.7190	.7822	.7822	-
			5	1.6462	1.6462	1.6462	1.6462	1.6462	1.6462	1.6462	1.6462	1.6462	1.6462	-	-	1.6462	1.6462	-
11.0	.41	.006539	4	.7743	.7743	.7743	.7743	.7743	.7743	.7743	.7743	.7743	.7743	.3533	.7111	.7743	.7743	-
			5	1.6304	1.6304	1.6304	1.6304	1.6304	1.6304	1.6304	1.6304	1.6304	1.6304	-	-	1.6304	1.6304	-
11.5	.41	.006704	4	.7664	.7664	.7664	.7664	.7664	.7664	.7664	.7664	.7664	.7664	.3494	.7032	.7664	.7664	-
			5	1.6146	1.6462	1.6146	1.6462	1.6146	1.6462	1.6146	1.6462	1.6146	1.6462	-	-	1.6146	1.6462	-
11.92	.40	.006780	4	.7598	.7598	.7598	.7598	.7598	.7598	.7598	.7598	.7598	.7598	.3461	.6966	.7598	.7598	-
			5	1.6014	1.6014	1.6014	1.6014	1.6014	1.6014	1.6014	1.6014	1.6014	1.6014	-	-	1.6014	1.6014	-



ADJUSTMENT FACTORS FOR REQUIRED GMt IN METERS WITH

BASE CONDITION - 4 HIGH

DRAFT IN METERS	BASE COND GMt REQ'D IN METERS	P TAN θ X DISPL.	NO. OF TIERS OD IN ROW	HOLD NO. 1		HOLD NO. 2		HOLD NO. 3		HOLD NO. 4		HOLD NO. 5		OVER ENG. RM.		HOLD NO. 6		OVER MOORING STATION
				ROW 1 (40')	ROW 2 (40')	ROW 4 (40')	ROW 5 (40')	ROW 7 (40')	ROW 8 (40')	ROW 9 (40')	ROW 10 (40')	ROW 11 (40')	ROW 12 (40')	ROW 13 (20')	ROW 14 (40')	ROW 15 (40')	ROW 16 (40')	ROW 17 (40')
6.5	1.13	.01264	5	.9272	.9272	.9272	.9272	.9272	.9272	.9272	.9272	.9272	.9272	-	-	.9272	.9272	-
7.0	1.01	.01152	5	.9193	.9193	.9193	.9193	.9193	.9193	.9193	.9193	.9193	.9193	-	-	.9193	.9193	-
7.5	.90	.01056	5	.9114	.9114	.9114	.9114	.9114	.9114	.9114	.9114	.9114	.9114	-	-	.9114	.9114	-
8.0	.82	.009736	5	.9035	.9035	.9035	.9035	.9035	.9035	.9035	.9035	.9035	.9035	-	-	.9035	.9036	-
8.5	.74	.009015	5	.8956	.8956	.8956	.8956	.8956	.8956	.8956	.8956	.8956	.8956	-	-	.8956	.8956	-
9.0	.67	.008381	5	.8877	.8877	.8877	.8877	.8877	.8877	.8877	.8877	.8877	.8877	-	-	.8877	.8877	-
9.5	.61	.007821	5	.8798	.8798	.8798	.8798	.8798	.8798	.8798	.8798	.8798	.8798	-	-	.8798	.8798	-
10.0	.56	.007320	5	.8719	.8719	.8719	.8719	.8719	.8719	.8719	.8719	.8719	.8719	-	-	.8719	.8719	-
10.29	.53	.007090	5	.8673	.8673	.8673	.8673	.8673	.8673	.8673	.8673	.8673	.8673	-	-	.8673	.8673	-
10.5	.51	.006871	5	.8640	.8640	.8640	.8640	.8640	.8640	.8640	.8640	.8640	.8640	-	-	.8640	.8640	-
11.0	.48	.006539	5	.8561	.8561	.8561	.8561	.8561	.8561	.8561	.8561	.8561	.8561	-	-	.8561	.8561	-
11.5	.47	.006704	5	.8482	.8482	.8482	.8482	.8482	.8482	.8482	.8482	.8482	.8482	-	-	.8482	.8482	-
11.92	.47	.006780	5	.8416	.8416	.8416	.8416	.8416	.8416	.8416	.8416	.8416	.8416	-	-	.8416	.8415	-

9. HYDROSTATIC TABLES

Displ. MTSW	Even Keel Draft		TPcm	Mom. to Trim 1m	LCB from ⊠	Change in Draft per m of Trim		KMt	Change in KM Trim Aft	
	Meters	Feet				@ Fwd Marks	@ Aft Marks		2 m	4 m
65000	12.33	40.45	70.44	113340	8.06A	0.55	0.44	15.28	0.163	0.207
64900	12.31	40.40	70.41	113189	8.05A	0.55	0.44	15.28	0.163	0.209
64800	12.30	40.35	70.37	113036	8.04A	0.55	0.44	15.27	0.163	0.211
64700	12.29	40.31	70.34	112881	8.03A	0.55	0.44	15.27	0.164	0.214
64600	12.27	40.26	70.30	112726	8.02A	0.55	0.44	15.27	0.164	0.216
64500	12.26	40.21	70.27	112570	8.01A	0.55	0.44	15.27	0.164	0.218
64400	12.24	40.17	70.23	112413	8.00A	0.55	0.44	15.27	0.164	0.221
64300	12.23	40.12	70.19	112254	7.99A	0.55	0.44	15.26	0.164	0.223
64200	12.21	40.07	70.16	112094	7.99A	0.55	0.44	15.26	0.165	0.225
64100	12.20	40.03	70.12	111934	7.98A	0.55	0.44	15.26	0.165	0.228
64000	12.19	39.98	70.09	111772	7.97A	0.55	0.44	15.26	0.165	0.230
63900	12.17	39.93	70.05	111608	7.96A	0.55	0.44	15.26	0.165	0.233
63800	12.16	39.89	70.02	111444	7.95A	0.55	0.44	15.26	0.165	0.236
63700	12.14	39.84	69.99	111278	7.94A	0.55	0.44	15.25	0.166	0.238
63600	12.13	39.79	69.95	111112	7.93A	0.55	0.44	15.25	0.166	0.241
63500	12.11	39.75	69.92	110944	7.92A	0.55	0.44	15.25	0.166	0.243
63400	12.10	39.70	69.88	110775	7.91A	0.55	0.44	15.25	0.166	0.246
63300	12.09	39.65	69.85	110605	7.90A	0.55	0.44	15.25	0.166	0.249
63200	12.07	39.61	69.81	110435	7.89A	0.55	0.44	15.25	0.167	0.251
63100	12.06	39.56	69.77	110263	7.88A	0.55	0.44	15.25	0.167	0.254
63000	12.04	39.51	69.74	110090	7.87A	0.55	0.44	15.24	0.167	0.256
62900	12.03	39.46	69.70	109916	7.86A	0.55	0.44	15.24	0.167	0.259
62800	12.01	39.42	69.66	109741	7.85A	0.55	0.44	15.24	0.167	0.261
62700	12.00	39.37	69.62	109565	7.84A	0.55	0.44	15.24	0.168	0.264
62600	11.99	39.32	69.58	109388	7.83A	0.55	0.44	15.24	0.168	0.266
62500	11.97	39.28	69.54	109210	7.82A	0.55	0.44	15.24	0.168	0.269
62400	11.96	39.23	69.50	109031	7.82A	0.55	0.44	15.24	0.168	0.271
62300	11.94	39.18	69.46	108851	7.81A	0.55	0.44	15.23	0.168	0.274
62200	11.93	39.14	69.42	108670	7.80A	0.55	0.44	15.23	0.168	0.276
62100	11.91	39.09	69.38	108487	7.79A	0.55	0.44	15.23	0.169	0.279
62000	11.90	39.04	69.34	108304	7.78A	0.55	0.44	15.23	0.169	0.281
61900	11.89	38.99	69.29	108119	7.77A	0.54	0.44	15.23	0.169	0.283
61800	11.87	38.95	69.25	107926	7.76A	0.54	0.44	15.23	0.169	0.285
61700	11.86	38.90	69.20	107733	7.75A	0.54	0.44	15.23	0.169	0.288
61600	11.84	38.85	69.15	107540	7.74A	0.54	0.44	15.23	0.169	0.290
61500	11.83	38.80	69.10	107346	7.73A	0.54	0.44	15.23	0.169	0.292
61400	11.81	38.76	69.05	107152	7.72A	0.54	0.44	15.22	0.170	0.294
61300	11.80	38.71	69.00	106958	7.72A	0.54	0.44	15.22	0.170	0.297
61200	11.78	38.66	68.95	106763	7.71A	0.54	0.44	15.22	0.170	0.299
61100	11.77	38.61	68.90	106568	7.70A	0.54	0.44	15.22	0.170	0.301
61000	11.76	38.57	68.86	106373	7.69A	0.54	0.44	15.22	0.170	0.303
60900	11.74	38.52	68.81	106178	7.68A	0.54	0.44	15.22	0.170	0.305
60800	11.73	38.47	68.76	105982	7.67A	0.54	0.44	15.22	0.171	0.307
60700	11.71	38.42	68.71	105786	7.66A	0.54	0.44	15.22	0.171	0.310
60600	11.70	38.38	68.67	105590	7.65A	0.54	0.44	15.22	0.171	0.312
60500	11.68	38.33	68.62	105393	7.64A	0.54	0.44	15.22	0.171	0.314
60400	11.67	38.28	68.57	105196	7.63A	0.54	0.44	15.21	0.171	0.316
60300	11.65	38.23	68.53	104999	7.62A	0.54	0.44	15.21	0.172	0.318
60200	11.64	38.19	68.48	104801	7.62A	0.54	0.44	15.21	0.172	0.321
60100	11.62	38.14	68.43	104603	7.61A	0.54	0.44	15.21	0.172	0.323

Note: Displacement and TPcm given in tonnes (metric tons).

9. HYDROSTATIC TABLES (Cont.)

Displ. MTSW	Even Keel Draft		TPcm	Mom. to Trim 1m	LCB from ⊠	Change in Draft per m of Trim		KMt	Change in KM Trim Aft	
	Meters	Feet				@ Fwd Marks	@ Aft Marks		2 m	4 m
60000	11.61	38.09	68.39	104405	7.60A	0.54	0.44	15.21	0.172	0.325
59900	11.60	38.04	68.34	104207	7.59A	0.54	0.44	15.21	0.173	0.327
59800	11.58	38.00	68.30	104008	7.58A	0.54	0.44	15.21	0.173	0.329
59700	11.57	37.95	68.26	103803	7.57A	0.54	0.44	15.21	0.174	0.332
59600	11.55	37.90	68.22	103599	7.56A	0.54	0.44	15.21	0.174	0.334
59500	11.54	37.85	68.17	103395	7.55A	0.54	0.44	15.21	0.175	0.336
59400	11.52	37.80	68.13	103192	7.54A	0.54	0.44	15.21	0.175	0.339
59300	11.51	37.76	68.09	102988	7.53A	0.54	0.44	15.21	0.176	0.341
59200	11.49	37.71	68.05	102785	7.52A	0.54	0.44	15.21	0.176	0.343
59100	11.48	37.66	68.01	102582	7.51A	0.54	0.44	15.21	0.177	0.345
59000	11.46	37.61	67.96	102379	7.50A	0.54	0.44	15.20	0.177	0.348
58900	11.45	37.57	67.92	102177	7.50A	0.54	0.44	15.20	0.177	0.350
58800	11.44	37.52	67.88	101975	7.49A	0.54	0.44	15.20	0.178	0.352
58700	11.42	37.47	67.84	101773	7.48A	0.54	0.44	15.20	0.178	0.354
58600	11.41	37.42	67.79	101571	7.47A	0.54	0.44	15.20	0.178	0.356
58500	11.39	37.37	67.75	101369	7.46A	0.54	0.44	15.20	0.179	0.358
58400	11.38	37.33	67.70	101168	7.45A	0.54	0.44	15.20	0.179	0.360
58300	11.36	37.28	67.66	100967	7.44A	0.54	0.44	15.20	0.179	0.362
58200	11.35	37.23	67.61	100766	7.43A	0.54	0.44	15.20	0.180	0.364
58100	11.33	37.18	67.57	100566	7.42A	0.54	0.44	15.20	0.180	0.366
58000	11.32	37.13	67.52	100365	7.41A	0.54	0.44	15.20	0.180	0.368
57900	11.30	37.08	67.48	100165	7.41A	0.54	0.44	15.20	0.181	0.370
57800	11.29	37.04	67.43	99966	7.40A	0.54	0.44	15.20	0.181	0.372
57700	11.27	36.99	67.39	99764	7.39A	0.54	0.44	15.20	0.181	0.374
57600	11.26	36.94	67.34	99558	7.38A	0.54	0.45	15.20	0.181	0.376
57500	11.24	36.89	67.29	99353	7.37A	0.54	0.45	15.20	0.181	0.378
57400	11.23	36.84	67.23	99149	7.36A	0.54	0.45	15.20	0.182	0.379
57300	11.21	36.79	67.18	98946	7.35A	0.54	0.45	15.20	0.182	0.381
57200	11.20	36.75	67.13	98744	7.35A	0.54	0.45	15.20	0.182	0.383
57100	11.19	36.70	67.09	98543	7.34A	0.54	0.45	15.20	0.182	0.385
57000	11.17	36.65	67.04	98343	7.33A	0.54	0.45	15.20	0.182	0.387
56900	11.16	36.60	66.99	98143	7.32A	0.54	0.45	15.20	0.182	0.388
56800	11.14	36.55	66.94	97945	7.31A	0.54	0.45	15.20	0.182	0.390
56700	11.13	36.50	66.89	97748	7.30A	0.54	0.45	15.20	0.182	0.391
56600	11.11	36.45	66.84	97551	7.30A	0.54	0.45	15.20	0.182	0.393
56500	11.10	36.40	66.79	97356	7.29A	0.54	0.45	15.20	0.182	0.394
56400	11.08	36.36	66.74	97161	7.28A	0.54	0.45	15.20	0.182	0.396
56300	11.07	36.31	66.70	96967	7.27A	0.54	0.45	15.20	0.182	0.397
56200	11.05	36.26	66.65	96775	7.26A	0.54	0.45	15.20	0.182	0.398
56100	11.04	36.21	66.60	96583	7.25A	0.54	0.45	15.20	0.182	0.399
56000	11.02	36.16	66.55	96392	7.25A	0.54	0.45	15.20	0.182	0.401
55900	11.01	36.11	66.51	96202	7.24A	0.54	0.45	15.20	0.182	0.402
55800	10.99	36.06	66.46	96013	7.23A	0.54	0.45	15.20	0.182	0.403
55700	10.98	36.01	66.41	95825	7.22A	0.54	0.45	15.20	0.182	0.404
55600	10.96	35.96	66.37	95642	7.21A	0.54	0.45	15.20	0.182	0.405
55500	10.95	35.91	66.32	95461	7.20A	0.54	0.45	15.20	0.182	0.406
55400	10.93	35.86	66.28	95281	7.20A	0.54	0.45	15.20	0.182	0.406
55300	10.92	35.81	66.23	95101	7.19A	0.54	0.45	15.20	0.182	0.407
55200	10.90	35.77	66.19	94921	7.18A	0.54	0.45	15.20	0.182	0.408
55100	10.89	35.72	66.14	94741	7.17A	0.54	0.45	15.20	0.182	0.409

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9. HYDROSTATIC TABLES (Cont.)

Displ. MTSW	Even Keel Draft		TPcm	Mom. to Trim 1m	LCB from ⊗	Change in Draft per m of Trim		KMt	Change in KM Trim Aft	
	Meters	Feet				@ Fwd Marks	@ Aft Marks		2 m	4 m
55000	10.87	35.67	66.10	94562	7.16A	0.54	0.45	15.20	0.182	0.409
54900	10.86	35.62	66.06	94383	7.16A	0.54	0.45	15.20	0.182	0.410
54800	10.84	35.57	66.01	94205	7.15A	0.54	0.45	15.20	0.181	0.410
54700	10.83	35.52	65.97	94027	7.14A	0.53	0.45	15.20	0.181	0.411
54600	10.81	35.47	65.92	93849	7.13A	0.53	0.45	15.20	0.181	0.411
54500	10.80	35.42	65.88	93671	7.12A	0.53	0.45	15.20	0.180	0.412
54400	10.78	35.37	65.83	93494	7.12A	0.53	0.45	15.21	0.180	0.412
54300	10.77	35.32	65.79	93318	7.11A	0.53	0.45	15.21	0.180	0.412
54200	10.75	35.27	65.74	93141	7.10A	0.53	0.45	15.21	0.179	0.412
54100	10.74	35.22	65.70	92965	7.09A	0.53	0.45	15.21	0.179	0.412
54000	10.72	35.17	65.65	92790	7.09A	0.53	0.45	15.21	0.178	0.412
53900	10.70	35.12	65.61	92614	7.08A	0.53	0.45	15.21	0.178	0.412
53800	10.69	35.07	65.56	92440	7.07A	0.53	0.45	15.21	0.177	0.412
53700	10.67	35.02	65.52	92265	7.06A	0.53	0.45	15.21	0.176	0.412
53600	10.66	34.97	65.47	92091	7.06A	0.53	0.45	15.21	0.175	0.412
53500	10.64	34.92	65.43	91917	7.05A	0.53	0.45	15.21	0.174	0.411
53400	10.63	34.87	65.38	91744	7.04A	0.53	0.45	15.21	0.173	0.410
53300	10.61	34.82	65.33	91571	7.04A	0.53	0.45	15.21	0.172	0.410
53200	10.60	34.77	65.29	91398	7.03A	0.53	0.45	15.21	0.171	0.409
53100	10.58	34.72	65.24	91226	7.02A	0.53	0.45	15.21	0.170	0.408
53000	10.57	34.67	65.19	91054	7.02A	0.53	0.45	15.22	0.169	0.408
52900	10.55	34.62	65.15	90882	7.01A	0.53	0.45	15.22	0.168	0.407
52800	10.54	34.57	65.10	90711	7.00A	0.53	0.45	15.22	0.167	0.406
52700	10.52	34.52	65.06	90540	7.00A	0.53	0.45	15.22	0.165	0.405
52600	10.51	34.47	65.01	90369	6.99A	0.53	0.45	15.22	0.164	0.405
52500	10.49	34.42	64.97	90199	6.98A	0.53	0.45	15.22	0.163	0.404
52400	10.48	34.37	64.92	90029	6.98A	0.53	0.45	15.22	0.162	0.403
52300	10.46	34.32	64.88	89859	6.97A	0.53	0.45	15.22	0.161	0.402
52200	10.45	34.27	64.83	89690	6.96A	0.53	0.45	15.22	0.160	0.402
52100	10.43	34.22	64.79	89521	6.96A	0.53	0.45	15.22	0.159	0.401
52000	10.41	34.17	64.75	89352	6.95A	0.53	0.45	15.23	0.158	0.400
51900	10.40	34.12	64.70	89184	6.94A	0.53	0.45	15.23	0.157	0.399
51800	10.38	34.07	64.66	89016	6.94A	0.53	0.45	15.23	0.156	0.398
51700	10.37	34.02	64.62	88849	6.93A	0.53	0.45	15.23	0.155	0.397
51600	10.35	33.97	64.58	88682	6.93A	0.53	0.45	15.23	0.154	0.396
51500	10.34	33.92	64.54	88517	6.92A	0.53	0.45	15.23	0.153	0.395
51400	10.32	33.86	64.50	88352	6.91A	0.53	0.45	15.23	0.152	0.394
51300	10.31	33.81	64.46	88187	6.91A	0.53	0.45	15.23	0.151	0.393
51200	10.29	33.76	64.42	88022	6.90A	0.53	0.45	15.24	0.150	0.392
51100	10.28	33.71	64.38	87857	6.89A	0.53	0.45	15.24	0.149	0.391
51000	10.26	33.66	64.34	87693	6.89A	0.53	0.45	15.24	0.148	0.390
50900	10.24	33.61	64.30	87529	6.88A	0.53	0.45	15.24	0.147	0.389
50800	10.23	33.56	64.26	87365	6.87A	0.53	0.45	15.24	0.146	0.387
50700	10.21	33.51	64.22	87201	6.87A	0.53	0.45	15.24	0.145	0.386
50600	10.20	33.46	64.18	87037	6.86A	0.53	0.45	15.24	0.144	0.385
50500	10.18	33.41	64.14	86873	6.86A	0.53	0.45	15.25	0.143	0.384
50400	10.17	33.36	64.10	86710	6.85A	0.53	0.45	15.25	0.143	0.383
50300	10.15	33.31	64.06	86546	6.84A	0.53	0.45	15.25	0.142	0.382
50200	10.14	33.25	64.01	86383	6.84A	0.53	0.45	15.25	0.141	0.382
50100	10.12	33.20	63.97	86220	6.83A	0.53	0.45	15.25	0.140	0.381

9. HYDROSTATIC TABLES (Cont.)

Displ. MTSW	Even Keel Draft		TPcm	Mom. to Trim 1m	LCB from ⊗	Change in Draft per m of Trim		KMt	Change in KM Trim Aft	
	Meters	Feet				@ Fwd Marks	@ Aft Marks		2 m	4 m
50000	10.10	33.15	63.93	86057	6.83A	0.53	0.46	15.25	0.140	0.380
49900	10.09	33.10	63.89	85895	6.82A	0.53	0.46	15.26	0.139	0.379
49800	10.07	33.05	63.84	85732	6.82A	0.53	0.46	15.26	0.139	0.378
49700	10.06	33.00	63.80	85570	6.81A	0.53	0.46	15.26	0.138	0.377
49600	10.04	32.95	63.75	85406	6.80A	0.53	0.46	15.26	0.138	0.376
49500	10.03	32.90	63.71	85243	6.80A	0.53	0.46	15.26	0.137	0.376
49400	10.01	32.84	63.66	85080	6.79A	0.53	0.46	15.27	0.137	0.375
49300	10.00	32.79	63.62	84917	6.79A	0.53	0.46	15.27	0.137	0.375
49200	9.98	32.74	63.57	84755	6.78A	0.53	0.46	15.27	0.136	0.374
49100	9.96	32.69	63.52	84593	6.78A	0.53	0.46	15.27	0.136	0.373
49000	9.95	32.64	63.48	84431	6.77A	0.53	0.46	15.28	0.136	0.373
48900	9.93	32.59	63.43	84270	6.77A	0.53	0.46	15.28	0.136	0.372
48800	9.92	32.54	63.38	84109	6.76A	0.53	0.46	15.28	0.136	0.371
48700	9.90	32.49	63.34	83948	6.76A	0.53	0.46	15.28	0.135	0.371
48600	9.89	32.43	63.29	83788	6.75A	0.53	0.46	15.29	0.135	0.370
48500	9.87	32.38	63.24	83628	6.75A	0.53	0.46	15.29	0.135	0.369
48400	9.85	32.33	63.20	83468	6.74A	0.53	0.46	15.29	0.135	0.368
48300	9.84	32.28	63.15	83309	6.74A	0.53	0.46	15.29	0.135	0.368
48200	9.82	32.23	63.10	83150	6.73A	0.53	0.46	15.30	0.134	0.367
48100	9.81	32.18	63.06	82992	6.73A	0.53	0.46	15.30	0.134	0.366
48000	9.79	32.12	63.01	82834	6.72A	0.53	0.46	15.30	0.134	0.365
47900	9.78	32.07	62.96	82676	6.72A	0.53	0.46	15.31	0.134	0.364
47800	9.76	32.02	62.92	82518	6.71A	0.53	0.46	15.31	0.134	0.363
47700	9.74	31.97	62.87	82360	6.71A	0.53	0.46	15.31	0.134	0.362
47600	9.73	31.92	62.82	82202	6.70A	0.53	0.46	15.32	0.134	0.361
47500	9.71	31.86	62.77	82044	6.70A	0.53	0.46	15.32	0.134	0.360
47400	9.70	31.81	62.72	81887	6.69A	0.53	0.46	15.32	0.134	0.359
47300	9.68	31.76	62.67	81731	6.69A	0.53	0.46	15.33	0.134	0.358
47200	9.66	31.71	62.63	81575	6.68A	0.53	0.46	15.33	0.134	0.357
47100	9.65	31.66	62.58	81419	6.68A	0.53	0.46	15.33	0.134	0.356
47000	9.63	31.60	62.53	81264	6.67A	0.53	0.46	15.34	0.134	0.354
46900	9.62	31.55	62.48	81109	6.67A	0.53	0.46	15.34	0.134	0.353
46800	9.60	31.50	62.44	80955	6.66A	0.53	0.46	15.35	0.135	0.352
46700	9.58	31.45	62.39	80802	6.66A	0.52	0.46	15.35	0.135	0.351
46600	9.57	31.39	62.34	80649	6.65A	0.52	0.46	15.35	0.135	0.350
46500	9.55	31.34	62.30	80496	6.65A	0.52	0.46	15.36	0.135	0.349
46400	9.54	31.29	62.25	80344	6.64A	0.52	0.46	15.36	0.135	0.348
46300	9.52	31.24	62.20	80193	6.64A	0.52	0.46	15.36	0.135	0.347
46200	9.50	31.18	62.16	80042	6.63A	0.52	0.46	15.37	0.135	0.346
46100	9.49	31.13	62.11	79891	6.63A	0.52	0.46	15.37	0.135	0.345
46000	9.47	31.08	62.07	79741	6.63A	0.52	0.46	15.37	0.135	0.344
45900	9.46	31.03	62.02	79592	6.62A	0.52	0.46	15.38	0.135	0.343
45800	9.44	30.97	61.98	79441	6.62A	0.52	0.46	15.38	0.135	0.343
45700	9.42	30.92	61.93	79289	6.61A	0.52	0.46	15.38	0.135	0.342
45600	9.41	30.87	61.89	79138	6.61A	0.52	0.46	15.39	0.136	0.341
45500	9.39	30.81	61.84	78987	6.61A	0.52	0.46	15.39	0.136	0.340
45400	9.38	30.76	61.80	78838	6.60A	0.52	0.46	15.39	0.136	0.339
45300	9.36	30.71	61.76	78690	6.60A	0.52	0.46	15.40	0.136	0.338
45200	9.34	30.66	61.71	78543	6.59A	0.52	0.46	15.40	0.136	0.337
45100	9.33	30.60	61.67	78396	6.59A	0.52	0.46	15.41	0.136	0.336

9 HYDROSTATIC TABLES (Cont.)

Displ. MTSW	Even Keel Draft		TPcm	Mom. to Trim 1m	LCB from ⊗	Change in Draft per m of Trim		KMt	Change in KM Trim Aft	
	Meters	Feet				@ Fwd Marks	@ Aft Marks		2 m	4 m
45000	9.31	30.55	61.63	78251	6.59A	0.52	0.46	15.41	0.136	0.335
44900	9.30	30.50	61.58	78106	6.58A	0.52	0.46	15.41	0.136	0.335
44800	9.28	30.44	61.54	77963	6.58A	0.52	0.46	15.42	0.136	0.334
44700	9.26	30.39	61.50	77820	6.58A	0.52	0.46	15.42	0.136	0.333
44600	9.25	30.34	61.46	77678	6.57A	0.52	0.46	15.42	0.136	0.332
44500	9.23	30.28	61.42	77537	6.57A	0.52	0.46	15.43	0.136	0.332
44400	9.21	30.23	61.38	77398	6.57A	0.52	0.46	15.43	0.136	0.331
44300	9.20	30.18	61.34	77259	6.56A	0.52	0.46	15.44	0.136	0.330
44200	9.18	30.12	61.29	77121	6.56A	0.52	0.46	15.44	0.136	0.330
44100	9.17	30.07	61.25	76984	6.55A	0.52	0.46	15.44	0.136	0.329
44000	9.15	30.02	61.21	76847	6.55A	0.52	0.46	15.45	0.136	0.328
43900	9.13	29.97	61.18	76714	6.55A	0.52	0.46	15.45	0.136	0.328
43800	9.12	29.91	61.14	76581	6.54A	0.52	0.46	15.46	0.136	0.327
43700	9.10	29.86	61.10	76450	6.54A	0.52	0.46	15.46	0.136	0.327
43600	9.08	29.80	61.06	76319	6.54A	0.52	0.46	15.47	0.136	0.326
43500	9.07	29.75	61.03	76188	6.54A	0.52	0.46	15.47	0.136	0.326
43400	9.05	29.70	60.99	76059	6.53A	0.52	0.46	15.48	0.135	0.326
43300	9.04	29.64	60.95	75930	6.53A	0.52	0.46	15.48	0.135	0.325
43200	9.02	29.59	60.91	75802	6.53A	0.52	0.46	15.48	0.135	0.325
43100	9.00	29.54	60.88	75674	6.52A	0.52	0.46	15.49	0.135	0.324
43000	8.99	29.48	60.84	75548	6.52A	0.52	0.46	15.49	0.134	0.324
42900	8.97	29.43	60.80	75422	6.52A	0.52	0.46	15.50	0.134	0.323
42800	8.95	29.38	60.76	75296	6.51A	0.52	0.46	15.50	0.134	0.323
42700	8.94	29.32	60.73	75172	6.51A	0.52	0.46	15.51	0.133	0.322
42600	8.92	29.27	60.69	75048	6.51A	0.52	0.46	15.51	0.133	0.322
42500	8.90	29.21	60.65	74925	6.50A	0.52	0.46	15.52	0.132	0.321
42400	8.89	29.16	60.61	74802	6.50A	0.52	0.46	15.52	0.132	0.321
42300	8.87	29.11	60.58	74680	6.50A	0.52	0.46	15.53	0.131	0.320
42200	8.86	29.05	60.54	74559	6.49A	0.52	0.46	15.53	0.131	0.320
42100	8.84	29.00	60.50	74439	6.49A	0.52	0.46	15.54	0.130	0.319
42000	8.82	28.94	60.46	74324	6.49A	0.52	0.46	15.55	0.129	0.318
41900	8.81	28.89	60.42	74209	6.48A	0.52	0.46	15.55	0.129	0.317
41800	8.79	28.84	60.39	74095	6.48A	0.52	0.46	15.56	0.128	0.317
41700	8.77	28.78	60.35	73980	6.48A	0.52	0.46	15.56	0.127	0.316
41600	8.76	28.73	60.31	73866	6.47A	0.52	0.46	15.57	0.126	0.315
41500	8.74	28.67	60.27	73752	6.47A	0.52	0.46	15.57	0.126	0.314
41400	8.72	28.62	60.23	73638	6.46A	0.52	0.46	15.58	0.125	0.314
41300	8.71	28.56	60.20	73524	6.46A	0.52	0.46	15.59	0.124	0.313
41200	8.69	28.51	60.16	73410	6.46A	0.52	0.46	15.59	0.123	0.312
41100	8.67	28.46	60.12	73297	6.45A	0.52	0.46	15.60	0.122	0.312
41000	8.66	28.40	60.08	73183	6.45A	0.52	0.46	15.60	0.121	0.311
40900	8.64	28.35	60.04	73070	6.45A	0.52	0.46	15.61	0.120	0.310
40800	8.62	28.29	60.01	72957	6.45A	0.52	0.46	15.62	0.119	0.310
40700	8.61	28.24	59.97	72844	6.44A	0.52	0.46	15.62	0.118	0.309
40600	8.59	28.18	59.93	72732	6.44A	0.52	0.46	15.63	0.117	0.309
40500	8.57	28.13	59.89	72619	6.44A	0.52	0.46	15.63	0.116	0.308
40400	8.56	28.07	59.85	72507	6.43A	0.52	0.46	15.64	0.115	0.308
40300	8.54	28.02	59.82	72395	6.43A	0.52	0.46	15.65	0.113	0.307
40200	8.52	27.97	59.78	72286	6.43A	0.52	0.47	15.65	0.111	0.307
40100	8.51	27.91	59.74	72180	6.43A	0.52	0.47	15.66	0.109	0.307

9. HYDROSTATIC TABLES (Cont.)

Displ. MTSW	Even Keel Draft		TPcm	Mom. to Trim 1m	LCB from O	Change in Draft per m of Trim		KMt	Change in KM Trim Aft	
	Meters	Feet				@ Fwd Marks	@ Aft Marks		2 m	4 m
40000	8.49	27.86	59.71	72073	6.42A	0.52	0.47	15.67	0.107	0.307
39900	8.47	27.80	59.67	71966	6.42A	0.52	0.47	15.67	0.105	0.307
39800	8.46	27.75	59.63	71858	6.42A	0.52	0.47	15.68	0.103	0.307
39700	8.44	27.69	59.60	71749	6.41A	0.52	0.47	15.69	0.101	0.307
39600	8.42	27.64	59.56	71640	6.41A	0.52	0.47	15.69	0.099	0.306
39500	8.41	27.58	59.52	71531	6.41A	0.52	0.47	15.70	0.097	0.306
39400	8.39	27.53	59.48	71421	6.41A	0.52	0.47	15.71	0.095	0.306
39300	8.37	27.47	59.44	71310	6.41A	0.52	0.47	15.72	0.094	0.306
39200	8.36	27.42	59.41	71199	6.40A	0.52	0.47	15.72	0.093	0.305
39100	8.34	27.36	59.37	71088	6.40A	0.52	0.47	15.73	0.091	0.305
39000	8.32	27.31	59.33	70976	6.40A	0.52	0.47	15.74	0.090	0.305
38900	8.31	27.25	59.29	70863	6.40A	0.52	0.47	15.75	0.089	0.304
38800	8.29	27.20	59.25	70750	6.40A	0.52	0.47	15.75	0.088	0.304
38700	8.27	27.14	59.21	70637	6.39A	0.52	0.47	15.76	0.087	0.303
38600	8.26	27.09	59.17	70523	6.39A	0.52	0.47	15.77	0.087	0.303
38500	8.24	27.03	59.12	70408	6.39A	0.52	0.47	15.78	0.086	0.302
38400	8.22	26.98	59.08	70294	6.39A	0.52	0.47	15.78	0.086	0.302
38300	8.21	26.92	59.04	70182	6.39A	0.52	0.47	15.79	0.087	0.301
38200	8.19	26.87	59.00	70069	6.39A	0.52	0.47	15.80	0.087	0.300
38100	8.17	26.81	58.96	69955	6.39A	0.52	0.47	15.81	0.088	0.299
38000	8.16	26.76	58.91	69840	6.39A	0.52	0.47	15.81	0.088	0.298
37900	8.14	26.70	58.87	69724	6.39A	0.52	0.47	15.82	0.089	0.297
37800	8.12	26.65	58.83	69607	6.39A	0.52	0.47	15.83	0.089	0.296
37700	8.10	26.59	58.78	69489	6.38A	0.52	0.47	15.84	0.090	0.295
37600	8.09	26.53	58.74	69370	6.38A	0.52	0.47	15.85	0.091	0.295
37500	8.07	26.48	58.69	69251	6.38A	0.52	0.47	15.85	0.091	0.294
37400	8.05	26.42	58.65	69130	6.38A	0.52	0.47	15.86	0.092	0.293
37300	8.04	26.37	58.60	69009	6.38A	0.52	0.47	15.87	0.093	0.292
37200	8.02	26.31	58.56	68886	6.38A	0.52	0.47	15.88	0.093	0.291
37100	8.00	26.25	58.51	68763	6.38A	0.52	0.47	15.89	0.094	0.290
37000	7.99	26.20	58.47	68638	6.38A	0.52	0.47	15.90	0.094	0.289
36900	7.97	26.14	58.42	68513	6.38A	0.52	0.47	15.91	0.095	0.288
36800	7.95	26.09	58.37	68386	6.38A	0.52	0.47	15.92	0.096	0.287
36700	7.93	26.03	58.33	68259	6.38A	0.52	0.47	15.93	0.097	0.286
36600	7.92	25.97	58.28	68127	6.38A	0.52	0.47	15.93	0.098	0.286
36500	7.90	25.92	58.22	67988	6.38A	0.52	0.47	15.94	0.100	0.285
36400	7.88	25.86	58.17	67851	6.38A	0.52	0.47	15.95	0.101	0.284
36300	7.87	25.81	58.12	67713	6.38A	0.52	0.47	15.96	0.103	0.283
36200	7.85	25.75	58.07	67576	6.38A	0.52	0.47	15.97	0.104	0.282
36100	7.83	25.69	58.01	67438	6.38A	0.52	0.47	15.98	0.106	0.281
36000	7.81	25.64	57.96	67301	6.38A	0.52	0.47	15.99	0.107	0.280
35900	7.80	25.58	57.91	67164	6.38A	0.52	0.47	16.00	0.108	0.279
35800	7.78	25.52	57.86	67028	6.38A	0.52	0.47	16.01	0.109	0.278
35700	7.76	25.47	57.81	66891	6.38A	0.52	0.47	16.02	0.110	0.277
35600	7.75	25.41	57.76	66755	6.38A	0.52	0.47	16.03	0.111	0.276
35500	7.73	25.35	57.71	66618	6.38A	0.51	0.47	16.04	0.111	0.275
35400	7.71	25.30	57.66	66482	6.38A	0.51	0.47	16.05	0.112	0.274
35300	7.69	25.24	57.61	66347	6.38A	0.51	0.47	16.06	0.112	0.273
35200	7.68	25.18	57.56	66211	6.38A	0.51	0.47	16.07	0.112	0.273
35100	7.66	25.13	57.51	66076	6.38A	0.51	0.47	16.08	0.112	0.272

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9. HYDROSTATIC TABLES (Cont.)

Displ. MTSW	Even Keel Draft		TPcm	Mom. to Trim 1m	LCB from ⊠	Change in Draft per m of Trim		KMt	Change in KM Trim Aft	
	Meters	Feet				@ Fwd Marks	@ Aft Marks		2 m	4 m
35000	7.64	25.07	57.46	65940	6.38A	0.51	0.47	16.10	0.112	0.271
34900	7.62	25.01	57.41	65805	6.38A	0.51	0.47	16.11	0.112	0.270
34800	7.61	24.96	57.37	65667	6.38A	0.51	0.47	16.12	0.111	0.269
34700	7.59	24.90	57.32	65528	6.38A	0.51	0.47	16.13	0.109	0.269
34600	7.57	24.84	57.28	65390	6.38A	0.51	0.47	16.14	0.107	0.268
34500	7.56	24.79	57.23	65253	6.38A	0.51	0.47	16.15	0.106	0.267
34400	7.54	24.73	57.18	65117	6.38A	0.51	0.47	16.17	0.104	0.266
34300	7.52	24.67	57.14	64981	6.38A	0.51	0.47	16.18	0.103	0.266
34200	7.50	24.62	57.09	64846	6.38A	0.51	0.47	16.19	0.101	0.265
34100	7.49	24.56	57.05	64711	6.38A	0.51	0.47	16.20	0.100	0.264
34000	7.47	24.50	57.00	64578	6.38A	0.51	0.47	16.22	0.098	0.263
33900	7.45	24.44	56.96	64445	6.38A	0.51	0.47	16.23	0.097	0.263
33800	7.43	24.39	56.91	64312	6.38A	0.51	0.47	16.24	0.096	0.262
33700	7.42	24.33	56.86	64181	6.38A	0.51	0.47	16.25	0.095	0.261
33600	7.40	24.27	56.82	64050	6.38A	0.51	0.47	16.27	0.094	0.261
33500	7.38	24.21	56.77	63919	6.39A	0.51	0.47	16.28	0.093	0.260
33400	7.36	24.16	56.73	63790	6.39A	0.51	0.47	16.29	0.092	0.260
33300	7.35	24.10	56.68	63661	6.39A	0.51	0.47	16.31	0.091	0.259
33200	7.33	24.04	56.63	63533	6.39A	0.51	0.47	16.32	0.090	0.258
33100	7.31	23.98	56.59	63403	6.39A	0.51	0.47	16.33	0.089	0.258
33000	7.29	23.93	56.53	63267	6.39A	0.51	0.47	16.35	0.088	0.257
32900	7.28	23.87	56.48	63134	6.39A	0.51	0.47	16.36	0.087	0.257
32800	7.26	23.81	56.43	63002	6.40A	0.51	0.47	16.37	0.086	0.256
32700	7.24	23.75	56.38	62871	6.40A	0.51	0.47	16.39	0.085	0.256
32600	7.22	23.69	56.34	62743	6.40A	0.51	0.47	16.40	0.085	0.255
32500	7.20	23.64	56.29	62617	6.40A	0.51	0.47	16.41	0.084	0.255
32400	7.19	23.58	56.24	62492	6.40A	0.51	0.47	16.43	0.084	0.254
32300	7.17	23.52	56.19	62369	6.41A	0.51	0.47	16.44	0.083	0.254
32200	7.15	23.46	56.15	62249	6.41A	0.51	0.47	16.46	0.083	0.253
32100	7.13	23.40	56.10	62129	6.41A	0.51	0.47	16.47	0.083	0.253
32000	7.12	23.35	56.06	62012	6.41A	0.51	0.47	16.49	0.082	0.253
31900	7.10	23.29	56.01	61897	6.42A	0.51	0.47	16.50	0.082	0.252
31800	7.08	23.23	55.97	61783	6.42A	0.51	0.47	16.52	0.082	0.252
31700	7.06	23.17	55.92	61672	6.42A	0.51	0.47	16.53	0.082	0.252
31600	7.05	23.11	55.88	61562	6.42A	0.51	0.47	16.55	0.082	0.251
31500	7.03	23.06	55.84	61454	6.43A	0.51	0.47	16.56	0.082	0.251
31400	7.01	23.00	55.80	61348	6.43A	0.51	0.47	16.58	0.082	0.251
31300	6.99	22.94	55.76	61254	6.43A	0.51	0.47	16.60	0.081	0.249
31200	6.97	22.88	55.73	61160	6.44A	0.51	0.47	16.61	0.080	0.248
31100	6.96	22.82	55.69	61067	6.44A	0.51	0.47	16.63	0.079	0.247
31000	6.94	22.76	55.66	60975	6.45A	0.51	0.47	16.65	0.078	0.246
30900	6.92	22.71	55.62	60883	6.45A	0.51	0.47	16.67	0.078	0.245
30800	6.90	22.65	55.59	60791	6.45A	0.51	0.47	16.68	0.078	0.245
30700	6.88	22.59	55.55	60701	6.46A	0.51	0.47	16.70	0.078	0.244
30600	6.87	22.53	55.52	60610	6.46A	0.51	0.47	16.72	0.079	0.244
30500	6.85	22.47	55.48	60521	6.47A	0.51	0.47	16.74	0.079	0.244
30400	6.83	22.41	55.45	60432	6.47A	0.51	0.47	16.76	0.080	0.245
30300	6.81	22.35	55.41	60344	6.47A	0.51	0.47	16.78	0.082	0.245
30200	6.80	22.29	55.38	60256	6.48A	0.51	0.47	16.79	0.083	0.246
30100	6.78	22.24	55.34	60169	6.48A	0.51	0.47	16.81	0.085	0.247

9. HYDROSTATIC TABLES (Cont.)

Displ. MTSW	Even Keel Draft		TPcm	Mom. to Trim 1m	LCB from ⊠	Change in Draft per m of Trim		KMt	Change in KM Trim Aft	
	Meters	Feet				@ Fwd Marks	@ Aft Marks		2 m	4 m
30000	6.76	22.18	55.31	60083	6.49A	0.51	0.47	16.83	0.087	0.248
29900	6.74	22.12	55.27	59997	6.49A	0.51	0.47	16.85	0.089	0.249
29800	6.72	22.06	55.23	59911	6.50A	0.51	0.47	16.87	0.091	0.250
29700	6.71	22.00	55.20	59827	6.50A	0.51	0.47	16.89	0.094	0.252
29600	6.69	21.94	55.16	59745	6.50A	0.51	0.47	16.91	0.099	0.255
29500	6.67	21.88	55.13	59664	6.51A	0.51	0.47	16.93	0.103	0.258
29400	6.65	21.82	55.09	59583	6.51A	0.51	0.47	16.95	0.108	0.261
29300	6.63	21.76	55.06	59503	6.52A	0.51	0.47	16.97	0.113	0.264
29200	6.61	21.70	55.02	59422	6.52A	0.51	0.47	16.99	0.118	0.267
29100	6.60	21.64	54.98	59342	6.53A	0.51	0.47	17.01	0.122	0.270
29000	6.58	21.58	54.95	59262	6.53A	0.51	0.47	17.03	0.127	0.273
28900	6.56	21.52	54.91	59183	6.54A	0.51	0.47	17.05	0.132	0.277
28800	6.54	21.46	54.88	59103	6.54A	0.51	0.47	17.07	0.137	0.280
28700	6.52	21.40	54.84	59024	6.55A	0.51	0.47	17.09	0.142	0.284
28600	6.51	21.34	54.81	58945	6.55A	0.51	0.47	17.12	0.147	0.287
28500	6.49	21.28	54.77	58867	6.56A	0.51	0.47	17.14	0.152	0.291
28400	6.47	21.22	54.73	58789	6.56A	0.51	0.47	17.16	0.157	0.295
28300	6.45	21.16	54.70	58711	6.57A	0.51	0.47	17.18	0.163	0.299
28200	6.43	21.10	54.66	58633	6.57A	0.51	0.47	17.20	0.168	0.303
28100	6.41	21.04	54.63	58556	6.58A	0.51	0.47	17.22	0.173	0.307
28000	6.40	20.98	54.59	58480	6.58A	0.51	0.47	17.25	0.180	0.312
27900	6.38	20.92	54.56	58408	6.59A	0.51	0.47	17.27	0.188	0.320
27800	6.36	20.86	54.52	58335	6.59A	0.51	0.47	17.29	0.197	0.327
27700	6.34	20.80	54.49	58262	6.60A	0.51	0.47	17.31	0.205	0.334
27600	6.32	20.74	54.46	58189	6.60A	0.51	0.47	17.34	0.212	0.340
27500	6.30	20.68	54.42	58115	6.61A	0.51	0.47	17.36	0.220	0.347
27400	6.29	20.62	54.39	58041	6.61A	0.51	0.47	17.38	0.226	0.352
27300	6.27	20.56	54.35	57966	6.62A	0.51	0.47	17.41	0.233	0.358
27200	6.25	20.50	54.31	57892	6.62A	0.51	0.47	17.43	0.239	0.363
27100	6.23	20.44	54.28	57817	6.63A	0.51	0.47	17.45	0.244	0.368
27000	6.21	20.38	54.24	57741	6.64A	0.51	0.47	17.48	0.249	0.373
26900	6.19	20.32	54.20	57666	6.64A	0.51	0.47	17.50	0.254	0.377
26800	6.18	20.26	54.17	57589	6.65A	0.51	0.47	17.52	0.258	0.381
26700	6.16	20.20	54.13	57513	6.65A	0.51	0.47	17.55	0.262	0.384
26600	6.14	20.14	54.09	57436	6.66A	0.51	0.47	17.57	0.266	0.387
26500	6.12	20.08	54.05	57359	6.66A	0.51	0.47	17.60	0.269	0.390
26400	6.10	20.02	54.01	57282	6.67A	0.51	0.47	17.62	0.271	0.392
26300	6.08	19.96	53.97	57203	6.67A	0.51	0.47	17.65	0.273	0.393
26200	6.06	19.90	53.93	57125	6.68A	0.51	0.47	17.67	0.274	0.393
26100	6.05	19.83	53.88	57046	6.68A	0.51	0.47	17.70	0.275	0.393
26000	6.03	19.77	53.84	56966	6.69A	0.51	0.47	17.72	0.275	0.393
25900	6.01	19.71	53.80	56887	6.70A	0.51	0.47	17.75	0.275	0.393
25800	5.99	19.65	53.76	56807	6.70A	0.51	0.47	17.77	0.275	0.392
25700	5.97	19.59	53.71	56727	6.71A	0.51	0.47	17.80	0.274	0.392
25600	5.95	19.53	53.67	56647	6.71A	0.51	0.47	17.82	0.274	0.391
25500	5.93	19.47	53.63	56566	6.72A	0.51	0.47	17.85	0.272	0.391
25400	5.92	19.41	53.59	56486	6.72A	0.51	0.47	17.88	0.271	0.390
25300	5.90	19.35	53.54	56405	6.73A	0.51	0.47	17.90	0.269	0.389
25200	5.88	19.29	53.50	56324	6.73A	0.51	0.47	17.93	0.267	0.388
25100	5.86	19.22	53.46	56242	6.74A	0.51	0.47	17.96	0.265	0.387

9. HYDROSTATIC TABLES (Cont.)

Displ. MTSW	Even Keel Draft		TPcm	Mom. to Trim 1m	LCB from ⊠	Change in Draft per m of Trim		KMt	Change in KM Trim Aft	
	Meters	Feet				@ Fwd Marks	@ Aft Marks		2 m	4 m
25000	5.84	19.16	53.42	56160	6.75A	0.51	0.47	17.99	0.262	0.386
24900	5.82	19.10	53.37	56078	6.75A	0.51	0.47	18.01	0.260	0.385
24800	5.80	19.04	53.33	55996	6.76A	0.51	0.47	18.04	0.256	0.384
24700	5.79	18.98	53.29	55914	6.76A	0.51	0.47	18.07	0.252	0.382
24600	5.77	18.92	53.24	55831	6.77A	0.51	0.47	18.10	0.247	0.380
24500	5.75	18.86	53.20	55749	6.77A	0.51	0.47	18.13	0.242	0.378
24400	5.73	18.80	53.16	55666	6.78A	0.51	0.47	18.15	0.236	0.376
24300	5.71	18.73	53.11	55583	6.78A	0.51	0.47	18.18	0.231	0.374
24200	5.69	18.67	53.07	55499	6.79A	0.51	0.47	18.21	0.225	0.372
24100	5.67	18.61	53.03	55415	6.79A	0.51	0.47	18.24	0.219	0.370
24000	5.65	18.55	52.99	55331	6.80A	0.51	0.47	18.27	0.214	0.368
23900	5.63	18.49	52.94	55247	6.80A	0.51	0.47	18.30	0.208	0.366
23800	5.62	18.43	52.90	55162	6.81A	0.51	0.47	18.33	0.202	0.364
23700	5.60	18.36	52.86	55077	6.82A	0.51	0.47	18.36	0.195	0.362
23600	5.58	18.30	52.81	54992	6.82A	0.51	0.47	18.39	0.189	0.359
23500	5.56	18.24	52.77	54906	6.83A	0.51	0.47	18.43	0.183	0.357
23400	5.54	18.18	52.73	54820	6.83A	0.51	0.47	18.46	0.176	0.355
23300	5.52	18.12	52.68	54734	6.84A	0.51	0.47	18.49	0.170	0.352
23200	5.50	18.05	52.64	54647	6.84A	0.51	0.47	18.52	0.163	0.350
23100	5.48	17.99	52.60	54561	6.85A	0.51	0.47	18.55	0.156	0.348
23000	5.47	17.93	52.56	54475	6.86A	0.51	0.47	18.59	0.145	0.346
22900	5.45	17.87	52.51	54389	6.86A	0.51	0.47	18.62	0.134	0.344
22800	5.43	17.81	52.47	54302	6.87A	0.51	0.47	18.65	0.124	0.342
22700	5.41	17.74	52.43	54215	6.87A	0.51	0.47	18.69	0.114	0.340
22600	5.39	17.68	52.39	54128	6.88A	0.51	0.47	18.72	0.105	0.338
22500	5.37	17.62	52.35	54040	6.89A	0.51	0.47	18.76	0.096	0.336
22400	5.35	17.56	52.30	53951	6.89A	0.51	0.47	18.79	0.088	0.333
22300	5.33	17.49	52.26	53862	6.90A	0.51	0.47	18.83	0.080	0.331
22200	5.31	17.43	52.22	53772	6.91A	0.51	0.47	18.86	0.072	0.328
22100	5.29	17.37	52.17	53682	6.91A	0.51	0.47	18.90	0.066	0.325
22000	5.28	17.31	52.13	53591	6.92A	0.51	0.47	18.93	0.059	0.322
21900	5.26	17.24	52.08	53499	6.92A	0.51	0.47	18.97	0.053	0.319
21800	5.24	17.18	52.03	53408	6.93A	0.51	0.47	19.00	0.047	0.316
21700	5.22	17.12	51.99	53315	6.94A	0.51	0.47	19.04	0.042	0.313
21600	5.20	17.06	51.94	53222	6.94A	0.51	0.47	19.08	0.038	0.309
21500	5.18	16.99	51.89	53129	6.95A	0.51	0.47	19.11	0.034	0.305
21400	5.16	16.93	51.85	53034	6.96A	0.51	0.47	19.15	0.032	0.299
21300	5.14	16.87	51.80	52940	6.96A	0.51	0.47	19.19	0.030	0.293
21200	5.12	16.80	51.75	52844	6.97A	0.51	0.47	19.22	0.029	0.287
21100	5.10	16.74	51.70	52749	6.98A	0.51	0.47	19.26	0.028	0.282
21000	5.08	16.68	51.65	52652	6.98A	0.51	0.47	19.30	0.027	0.276
20900	5.06	16.61	51.60	52556	6.99A	0.51	0.47	19.34	0.026	0.271
20800	5.04	16.55	51.55	52458	7.00A	0.51	0.47	19.38	0.025	0.266
20700	5.03	16.49	51.50	52361	7.00A	0.51	0.47	19.42	0.025	0.262
20600	5.01	16.42	51.45	52263	7.01A	0.51	0.47	19.46	0.025	0.257
20500	4.99	16.36	51.40	52164	7.02A	0.51	0.47	19.50	0.025	0.253
20400	4.97	16.30	51.35	52065	7.03A	0.51	0.47	19.54	0.025	0.249
20300	4.95	16.23	51.29	51965	7.03A	0.51	0.47	19.58	0.025	0.245
20200	4.93	16.17	51.24	51865	7.04A	0.51	0.47	19.62	0.026	0.241
20100	4.91	16.10	51.19	51765	7.05A	0.51	0.47	19.66	0.026	0.237

9. HYDROSTATIC TABLES (Cont.)

Displ. MTSW	Even Keel Draft		TPcm	Mom. to Trim 1m	LCB from ⊠	Change in Draft per m of Trim		KMt	Change in KM Trim Aft	
	Meters	Feet				@ Fwd Marks	@ Aft Marks		2 m	4 m
20000	4.89	16.04	51.13	51664	7.06A	0.51	0.47	19.70	0.027	0.234
19900	4.87	15.98	51.08	51562	7.06A	0.51	0.47	19.75	0.028	0.231
19800	4.85	15.91	51.03	51461	7.07A	0.51	0.47	19.79	0.030	0.228
19700	4.83	15.85	50.97	51358	7.08A	0.51	0.47	19.83	0.031	0.225
19600	4.81	15.78	50.91	51255	7.09A	0.51	0.47	19.88	0.033	0.223
19500	4.79	15.72	50.86	51152	7.09A	0.51	0.47	19.92	0.035	0.220
19400	4.77	15.66	50.80	51048	7.10A	0.51	0.47	19.97	0.037	0.218
19300	4.75	15.59	50.74	50944	7.11A	0.51	0.47	20.01	0.040	0.216
19200	4.73	15.53	50.69	50839	7.12A	0.51	0.47	20.06	0.042	0.215
19100	4.71	15.46	50.63	50734	7.13A	0.51	0.47	20.11	0.045	0.213
19000	4.69	15.40	50.57	50628	7.14A	0.51	0.47	20.15	0.048	0.212
18900	4.67	15.33	50.51	50522	7.14A	0.51	0.47	20.20	0.051	0.211
18800	4.65	15.27	50.45	50415	7.15A	0.51	0.47	20.25	0.054	0.210
18700	4.63	15.20	50.39	50308	7.16A	0.51	0.47	20.30	0.058	0.209
18600	4.61	15.14	50.33	50201	7.17A	0.51	0.47	20.34	0.061	0.208
18500	4.59	15.07	50.27	50093	7.18A	0.51	0.47	20.39	0.065	0.208
18400	4.57	15.01	50.21	49984	7.19A	0.51	0.47	20.44	0.069	0.208
18300	4.55	14.94	50.15	49875	7.20A	0.51	0.47	20.49	0.074	0.208
18200	4.53	14.88	50.08	49766	7.21A	0.51	0.47	20.54	0.078	0.208
18100	4.52	14.81	50.02	49656	7.22A	0.51	0.47	20.60	0.083	0.209
18000	4.50	14.75	49.96	49545	7.23A	0.51	0.47	20.65	0.088	0.210

11. CHANGE IN DRAFT AND GM FOR EMPTYING TANKS

These tables are for guidance in estimating ballasting requirements prior to performance of the Trim and Stability calculations. Values listed for 'Change in Draft' and 'Change in GM' are calculated for three drafts: 7.0m, 9.0m and 11.0m. For approximations at other drafts, either read values directory from the table for the nearest draft, or interpolate between values given for the two drafts which bracket the actual.

The table shows the change in draft at the F/A marks and change in GM when emptying one set of tanks from full capacity No corrections have been made for free surface.

Tank	Capacity Tonnes	Initial Condition Draft 7.00 meters Displ. 31,345 tonnes KG 15.06 meters			Initial Condition Draft 9.00 meters Displ. 43,081 tonnes KG 14.75 meters			Initial Condition Draft 11.00 meters Displ. 55,859 tonnes KG 14.48 meters		
		Change in Draft (M)		GM	Change in Draft (M)		GM	Change in Draft (M)		GM
		Fwd Marks	Aft Marks	change	Fwd Marks	Aft marks	change	Fwd Marks	Aft Marks	change
NO.3 F.W.F.O.T. P/S	450	-0.21	0.04	-0.02	-0.18	0.02	-0.04	-0.15	0.01	-0.05
NO.3 A.W.F.O.T. P/S	548	-0.18	-0.02	-0.02	-0.16	-0.03	-0.05	-0.14	-0.03	-0.06
DEEP F.O.T. P	462	0.14	-0.29	-0.03	0.11	-0.24	-0.05	0.08	-0.19	-0.05
DEEP F.O.T. S	469	0.15	-0.30	-0.02	0.11	-0.25	-0.05	0.08	-0.20	-0.05
H.F.O. SETT.T. P	116	0.03	-0.07	0.00	0.03	-0.06	-0.01	0.02	-0.05	-0.01
H.F.O. SETT.T. S	116	0.03	-0.07	0.01	0.03	-0.06	-0.00	0.02	-0.05	-0.01
H.F.O. SERV.T.	120	0.03	-0.07	0.01	0.03	-0.06	-0.00	0.02	-0.05	0.00
DIESEL OIL T. P	74	0.02	-0.05	-0.02	0.02	-0.04	-0.02	0.01	-0.03	-0.02
DIESEL OIL T. S	86	0.03	-0.06	-0.02	0.02	-0.05	-0.02	0.02	-0.04	-0.02
D.O. SETT.T.	20	0.01	-0.01	0.00	0.01	-0.01	0.00	0.00	-0.01	0.00
D.O. SERV.T.	20	0.01	-0.01	0.00	0.01	-0.01	0.00	0.00	-0.01	0.00
NO.1 POT.W.T. P/S	117	-0.12	0.08	0.03	-0.11	0.06	0.01	-0.09	0.04	0.01
NO.2 POT.W.T.	111	0.04	-0.08	0.02	0.03	-0.07	0.01	0.03	-0.05	0.00
DIST.W.T.	31	0.01	-0.02	0.00	0.01	-0.02	0.00	0.01	-0.02	0.00
DEEP W.B.T.	381	-0.45	0.29	-0.01	-0.38	0.22	-0.03	-0.32	0.16	-0.04
NO.1 BTM. W.B.T.	1565	-1.42	0.78	-0.30	-1.20	0.58	-0.33	-1.00	0.42	-0.30
NO.2 F. W.B.T. P/S	566	-0.40	0.18	-0.05	-0.34	0.13	-0.07	-0.29	0.09	-0.07
NO.2 A. W.B.T. P	789	-0.46	0.16	-0.08	-0.39	0.11	-0.11	-0.34	0.07	-0.11
NO.2 A. W.B.T. S	790	-0.46	0.16	-0.08	-0.40	0.11	-0.11	-0.34	0.07	-0.11
NO.3 BTM.W.B.T. P/S	413	-0.16	0.00	-0.12	-0.14	-0.01	-0.11	-0.12	-0.01	-0.10
NO.4 F.W.W.B.T. P/S	481	-0.10	-0.08	-0.02	-0.09	-0.07	-0.05	-0.08	-0.06	-0.05
NO.4 BTM.W.B.T. P/S	624	-0.08	-0.14	-0.18	-0.08	-0.13	-0.17	-0.08	-0.11	-0.15
NO.4 A.W.W.B.T. P/S	606	-0.04	-0.17	-0.02	-0.05	-0.15	-0.06	-0.05	-0.12	-0.06
NO.5 BTM.W.B.T. P/S	532	0.06	-0.24	-0.15	0.04	-0.20	-0.15	0.02	-0.17	-0.13
NO.5 WING W.B.T. P/S	567	0.04	-0.23	-0.02	0.02	-0.19	-0.05	0.00	-0.16	-0.06
NO.6 WING W.B.T. P/S	580	0.32	-0.50	0.01	0.26	-0.41	-0.03	0.20	-0.32	-0.04
AFT PEAK T. P	453	0.36	-0.49	0.04	0.29	-0.40	-0.01	0.22	-0.31	-0.02
AFT PEAK T. S	462	0.36	-0.50	0.04	0.29	-0.41	-0.01	0.23	-0.32	-0.02
ANTI-HEELING T. P/S	616	0.12	-0.33	-0.03	0.09	-0.27	-0.07	0.06	-0.22	-0.07

10. CHANGE IN DRAFT AND GM FOR FILLING TANKS

These tables are for guidance in estimating ballasting requirements prior to performance of the Trim and Stability calculations. Values listed for 'Change in Draft' and 'Change in GM' are calculated for three drafts: 7.0m, 9.0m and 11.0m. For approximations at other drafts, either read values directory from the table for the nearest draft, or interpolate between values given for the two drafts which bracket the actual.

The table shows the change in draft at the F/A marks and change in GM when filling one set of tanks to capacity No corrections have been made for free surface.

Tank	Capacity Tonnes	Initial Condition Draft 7.00 meters Displ. 31,345 tonnes KG 15.06 meters			Initial Condition Draft 9.00 meters Displ. 43,081 tonnes KG 14.75 meters			Initial Condition Draft 11.00 meters Displ. 55,859 tonnes KG 14.48 meters		
		Change in Draft (M)		GM	Change in Draft (M)		GM	Change in Draft (M)		GM
		Fwd Marks	Aft Marks	change	Fwd Marks	Aft marks	change	Fwd Marks	Aft Marks	change
NO.3 F.W.F.O.T. P/S	450	0.20	-0.03	0.02	0.18	-0.02	0.04	0.15	-0.00	0.05
NO.3 A.W.F.O.T. P/S	548	0.18	0.02	0.02	0.16	0.03	0.05	0.14	0.03	0.05
DEEP F.O.T. P	462	-0.14	0.29	0.03	-0.11	0.24	0.05	-0.07	0.19	0.05
DEEP F.O.T. S	469	-0.14	0.29	0.02	-0.11	0.24	0.05	-0.08	0.19	0.05
H.F.O. SETT.T. P	116	-0.03	0.07	-0.00	-0.03	0.06	0.01	-0.02	0.05	0.01
H.F.O. SETT.T. S	116	-0.03	0.07	-0.01	-0.03	0.06	0.00	-0.02	0.05	0.01
H.F.O. SERV.T.	120	-0.03	0.07	-0.01	-0.03	0.06	0.00	-0.02	0.05	0.00
DIESEL OIL T. P	74	-0.03	0.05	0.02	-0.02	0.04	0.02	-0.01	0.03	0.02
DIESEL OIL T. S	86	-0.03	0.06	0.02	-0.02	0.05	0.02	-0.02	0.04	0.02
D.O. SETT.T.	20	-0.01	0.01	-0.00	-0.01	0.01	-0.00	-0.00	0.01	0.00
D.O. SERV.T.	20	-0.01	0.01	-0.00	-0.01	0.01	-0.00	-0.00	0.01	-0.00
NO.1 POT.W.T. P/S	117	0.12	-0.08	-0.03	0.10	-0.06	-0.01	0.09	-0.04	-0.01
NO.2 POT.W.T.	111	-0.04	0.08	-0.02	-0.03	0.06	-0.01	-0.02	0.05	-0.00
DIST.W.T.	31	-0.01	0.02	-0.00	-0.01	0.02	-0.00	-0.01	0.02	0.00
DEEP W.B.T.	381	0.45	-0.28	0.01	0.38	-0.22	0.03	0.31	-0.16	0.03
NO.1 BTM. W.B.T.	1565	1.36	-0.72	0.30	1.15	-0.54	0.31	0.96	-0.37	0.29
NO.2 F. W.B.T. P/S	566	0.40	-0.17	0.05	0.34	-0.13	0.07	0.29	-0.08	0.07
NO.2 A. W.B.T. P	789	0.45	-0.15	0.08	0.39	-0.10	0.11	0.33	-0.06	0.11
NO.2 A. W.B.T. S	790	0.45	-0.15	0.08	0.39	-0.10	0.11	0.33	-0.06	0.11
NO.3 BTM.W.B.T. P/S	413	0.15	-0.00	0.12	0.14	0.01	0.11	0.12	0.01	0.10
NO.4 F.W.W.B.T. P/S	481	0.10	0.08	0.02	0.09	0.07	0.05	0.08	0.06	0.05
NO.4 BTM.W.B.T. P/S	624	0.08	0.14	0.18	0.08	0.12	0.17	0.08	0.11	0.15
NO.4 A.W.W.B.T. P/S	606	0.04	0.17	0.03	0.05	0.14	0.06	0.05	0.12	0.06
NO.5 BTM.W.B.T. P/S	532	-0.06	0.24	0.15	-0.04	0.20	0.14	-0.02	0.16	0.13
NO.5 WING W.B.T. P/S	567	-0.03	0.23	0.02	-0.02	0.19	0.05	-0.00	0.16	0.06
NO.6 WING W.B.T. P/S	580	-0.32	0.49	-0.00	-0.25	0.40	0.04	-0.19	0.32	0.04
AFT PEAK T. P	453	-0.35	0.48	-0.03	-0.28	0.39	0.01	-0.22	0.31	0.02
AFT PEAK T. S	462	-0.36	0.49	-0.03	-0.29	0.40	0.01	-0.22	0.31	0.02
ANTI-HEELING T. P/S	616	-0.12	0.32	0.04	-0.09	0.27	0.06	-0.06	0.22	0.07

TS-1

DEPARTURE CALCULATION

SAMPLE

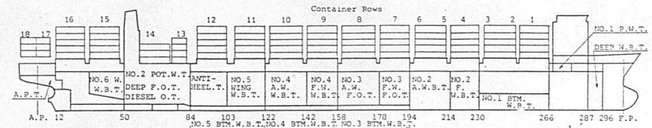
Voyage______ Departure Port______ Arrival Port______ Date______

	Weight Tonnes	L.Moment Fwd (MT)	L.Moment Aft (MT)	VCG (M)	V.Moment (MT)	F.S. Moment (MT)
Operating Lightship	17472	------	250244	-----	213418	62
Containers -Sheet TS-2	14982	294581	388223	-	255298	-
Fuel Oil -Sheet TS-3	3279	35186	79406	-	28845	1459
Diesel Oil -Sheet TS-3	200	-	13555	-	838	368
Fresh Water-Sheet TS-3	375	22512	10593	-	6142	457
Salt Water -Sheet TS-4	1565	119119	-	-	6136	-
Misc. Tanks-Sheet TS-4	-	-	-	-	-	-
1. Totals	37873 a	471398 b	742021 c	13.48 d	510677 e	2346 f

DRAFT AND TRIM CALCULATION			STABILITY CALCULATION	
2. Even Keel Draft (Hydrostatics)	8.13		18. Change in KM (Hydrostatics) $0.089 \times \frac{0.41}{2.0}$	0.02
3. L.Mom. for Trim (1c) - (1b) If (-) then F, if (+) then A	270623	F/A	19. KM at Even Keel Draft (Hydrostatics)	15.82
4. LCG (3) ÷ (1a)	7.15	F/A	20. KM Corrected If (9) is (F) then (19)-(18) If (9) is (A) then (19)+(18)	15.84
5. LCB (Hydrostatics)	6.39	F/A	21. KG (1d) = (1e) ÷ (1a)	13.48
6. Trim Lever (4) - (5) If (-) the F, if (+) then A	0.76	F/A	22. GM Uncorrected (20) - (21)	2.36
7. Trim Moment (1a) x (6)	28783		23. F.S. Correction (1f) ÷ (1a)	0.06
8. Moment to Trim One Meter (Hydrostatics)	69692		24. GM Corrected (22) - (23)	2.30
9. Trim in Meters (7) ÷ (8)	0.41	F/A	25. GM Required	0.90

		Observed	Port	Stbd	Average
10. Change in Draft Fwd per Meter of Trim (Hydrostatics)	0.52	Draft Fwd			
11. Draft Change Fwd (9) x (10)	0.21				
12. Draft At Fwd Marks If (9) is (F) then (2) + (11) If (9) is (A) then (2) - (11)	7.92				
13. Change in Draft Aft per Meter of Trim (Hydrostatics)	0.47	Draft Aft			
14. Draft Change Aft (9) x (13)	0.19				
15. Draft at Aft Marks If (9) is (F) then (2) - (14) If (9) is (A) then (2) + (14)	8.32	Midship			
16. Mean Draft [(12) + (15)] ÷ 2	8.12	Trim			

12. TRIM TABLES



Location	7.0 m Draft		9.0 m Draft		11.0m Draft	
	Fwd	Aft	Fwd	Aft	Fwd	Aft
DEEP W.B.T.	0.12	-0.07	0.10	-0.06	0.08	-0.01
NO.1 POT.W.T. P/S	0.11	-0.06	0.09	-0.05	0.08	-0.04
ROW 1 40'S	0.10	-0.05	0.08	-0.04	0.07	-0.03
NO.1 BTM.W.B.T.	0.09	-0.05	0.08	-0.04	0.07	-0.03
ROW 2 20'S	0.09	-0.05	0.07	-0.04	0.06	-0.03
ROW 3 20'S	0.08	-0.04	0.07	-0.03	0.06	-0.02
ROW 4 40'S	0.07	-0.03	0.06	-0.02	0.05	-0.02
NO.2 F.W.B.T. P/S	0.07	-0.03	0.06	-0.02	0.05	-0.02
ROW 5 20'S	0.06	-0.02	0.05	-0.02	0.05	-0.01
NO.2 A.W.B.T. P/S	0.06	-0.02	0.05	-0.01	0.04	-0.01
ROW 6 20'S	0.05	-0.02	0.05	-0.01	0.04	-0.01
ROW 7 40'S	0.04	-0.01	0.04	0.00	0.04	0.00
NO.3 F.W.F.O.T. P/S	0.04	-0.01	0.04	0.00	0.04	0.00
NO.3 BTM.W.B.T. P/S	0.04	0.00	0.03	0.00	0.03	0.00
ROW 8 40'S	0.03	0.00	0.03	0.00	0.03	0.00
NO.3 A.W.F.O.T. P/S	0.03	0.01	0.03	0.00	0.03	0.00
ROW 9 40'S	0.02	0.02	0.02	0.01	0.02	0.01
NO.4 F.W.W.B.T. P/S	0.02	0.02	0.02	0.01	0.02	0.01
NO.4 BTM.W.B.T. P/S	0.01	0.02	0.01	0.02	0.01	0.02
ROW 10 40'S	0.01	0.03	0.01	0.02	0.01	0.02
NO.4 A.W.W.B.T. P/S	0.01	0.03	0.01	0.02	0.01	0.02
ROW 11 40'S	-0.01	0.04	0.00	0.03	0.00	0.03
NO.5 WING W.B.T. P/S	-0.01	0.04	0.00	0.03	0.00	0.03
NO.5 BTM.W.B.T. P/S	-0.01	0.05	-0.01	0.04	0.00	0.03
ROW 12 40'S	-0.02	0.05	-0.01	0.04	-0.01	0.03
ANTI-HEELING T. P/S	-0.02	0.05	-0.01	0.04	-0.01	0.03
DEEP F.O.T. P	-0.03	0.06	-0.02	0.05	-0.01	0.04
ROW 13 20'S	-0.03	0.06	-0.02	0.05	-0.01	0.04
DEEP F.O.T. S	-0.03	0.06	-0.02	0.05	-0.01	0.04
DIESEL OIL T. P	-0.03	0.07	-0.03	0.05	-0.02	0.04
DIESEL OIL T. S	-0.04	0.07	-0.03	0.06	-0.02	0.04
ROW 14 40'S	-0.04	0.07	-0.03	0.06	-0.02	0.04
NO.2 POT.W.T.	-0.04	0.07	-0.03	0.06	-0.02	0.04
NO.6 WING W.B.T. P/S	-0.06	0.09	-0.04	0.07	-0.03	0.05
ROW 15 40'S	-0.06	0.09	-0.04	0.07	-0.03	0.05
ROW 16 40'S	-0.07	0.10	-0.05	0.08	-0.04	0.06
AFT PEAK T. P/S	-0.08	0.11	-0.06	0.09	-0.05	0.07
ROW 17 20'S	-0.08	0.11	-0.06	0.09	-0.05	0.07
ROW 18 20'S	-0.08	0.11	-0.06	0.09	-0.05	0.07

The above table shows correction in meters to draft fwd and aft for each 100 tonnes loaded at any location.

When discharging, use the table as for loading, but reverse the plus and minus signs.

EXAMPLE: Find the change in draft readings after discharging 100 tonnes in DEEP W.B.T. Initial draft fwd = 8.7 m; initial draft aft = 9.3 m. Use the 9.0 m draft table. Corrections = 0.10 fwd, -0.06 aft. New draft readings are 8.80 m fwd and 9.24 m aft.

TS-2F

SAMPLE

CONTAINER STOWAGE SUMMARY
FOR CONTAINER ROWS FWD OF AMIDSHIP

Voyage__________ Departure Port__________ Arrival Port__________ Date__________

Row	No. Containers			Weight* Tonnes	V.Moment* (MT)	LCG M - ⊠	Fwd L.Moment. (MT)
	20's	40's	45's				
1 Above Dk	----	65	----	442	11176	84.95 F	37548 F
	----	----				84.95 F	F
1 Below Dk	----	14	----	210	2876	84.95 F	17840 F
2 Above Dk	10	----	----	46	1152	74.19 F	3413 F
	----	55	----	374	9456	70.36 F	26315 F
	----	----				70.36 F	F
2 Below Dk	----	30	----	450	5796	71.12 F	32004 F
3 Above Dk	10	----	----	46	1152	66.53 F	3060 F
4 Above Dk	----	65	----	442	11176	55.43 F	24500 F
	----	----				55.43 F	F
4 Below Dk	----	40	----	600	7115	55.43 F	33258 F
5 Above Dk	10	----	----	46	1152	44.67 F	2055 F
	----	55	----	374	9456	40.84 F	15274 F
	----	----				40.84 F	F
5 Below Dk	60	----	----	600	7186	44.67 F	26802 F
6 Above Dk	10	----	----	46	1152	37.01 F	1702 F
6 Below Dk	60	----	----	600	7186	37.01 F	22206 F
7 Above Dk	----	65	----	442	11176	25.91 F	11452 F
	----	----				25.91 F	F
7 Below Dk	----	54	----	810	8646	25.91 F	20987 F
8 Above Dk	----	65	----	442	11176	11.32 F	5003 F
	----	----				11.32 F	F
8 Below Dk	----	----	58	986	10580	11.32 F	11162 F
TOTALS FWD	160	508	58	6956	117609		294581 F

* Weight and vertical moment of each row are summed on the Container Stowage Sheets.

LCG's for container stacks aft of amidships are listed on the following page.

TS-2A

SAMPLE

CONTAINER STOWAGE SUMMARY
FOR CONTAINER ROWS AFT OF AMIDSHIP

Voyage__________ Departure Port__________ Arrival Port__________ Date__________

Row	No. Containers			Weight* Tonnes	V.Moment* (MT)	LCG M - ⊠	Aft L.Moment (MT)
	20's	40's	45's				
9 Above Dk	----	65	----	442	11176	3.61 A	1596 A
	----	----				3.61 A	A
9 Below Dk	----	60	----	900	9010	3.61 A	3249 A
10 Above Dk	----	65	----	442	11176	18.20 A	8044 A
	----	----				18.20 A	A
10 Below Dk	----	----	60	1020	10690	18.20 A	18564 A
11 Above Dk	----	65	----	442	11176	33.12 A	14639 A
	----	----				33.12 A	A
11 Below Dk	----	60	----	900	9010	33.12 A	29808 A
12 Above Dk	----	65	----	442	11176	48.67 A	21512 A
	----	----				48.67 A	A
12 Below Dk	----	58	----	870	8915	48.67 A	42343 A
13 Above Dk	46	----	----	232	5229	62.54 A	14509 A
14 Above Dk	----	34	----	306	6758	72.23 A	22102 A
15 Above Dk	----	65	----	442	11176	92.88 A	41053 A
	----	----				92.88 A	A
15 Below Dk	----	28	----	420	5819	92.88 A	39010 A
16 Above Dk	----	65	----	442	11176	107.13 A	47351 A
	----	----				107.13 A	A
16 Below Dk	----	18	----	270	4058	107.13 A	28925 A
17 Above Dk	36	----	----	228	5572	118.37 A	26988 A
	----		----			121.75 A	A
18 Above Dk	36	----	----	228	5572	125.13 A	28530 A
TOTALS AFT	118	648	60	8026	137689		388223 A
TOTALS FWD	160	508	58	6956	117609		294581 F
TOTALS	278	1156	118	14982	255298		

* Weight and vertical moment of each row are summed on the Container Stowage Sheets.

Enter "TOTALS FWD" from the previous sheet.

TS-3

SAMPLE

TANK CAPACITIES - FUEL OIL, DIESEL OIL, FRESH WATER Date__________

FUEL OIL (Specific Gravity = 0.9845)

TANK	Weight - Tonnes		LCG (M)	L.Moment		VCG* (M)	V.Moment		Free Surface		
	98%	Actual		Actual	98%		Actual	98%	98%	Slack	Actual
NO.3 F.W. F.O.T. P	450.3	450.3	25.76F	11600 F	11,600F	8.57	3859	3,859	22	37	22
NO.3 F.W. F.O.T. S	450.3	450.3	25.76F	11600 F	11,600F	8.57	3859	3,859	22	37	22
NO.3 A.W. F.O.T. P	547.8	547.8	10.94F	5993 F	5,993F	8.78	4810	4,810	27	27	27
NO.3 A.W. F.O.T. S	547.8	547.8	10.94F	5993 F	5,993F	8.78	4810	4,810	27	27	27
Total L.Moment Fwd				35186 F	35,186F						
DEEP F.O.T. P	461.6	461.6	62.01A	28624 A	28,624A	7.88	3637	3,637	5	550	550
DEEP F.O.T. S	469.1	469.1	62.83A	29474 A	29,474A	8.26	3875	3,875	11	552	552
H.F.O. SETT. T. P	116.4	116.4	60.57A	7050 A	7,050A	10.40	1211	1,211	157	157	157
H.F.O. SETT. T. S	115.6	115.6	60.53A	6997 A	6,997A	11.52	1332	1,332	81	81	81
H.F.O. SERV. T.	119.8	119.8	60.61A	7261 A	7,261A	12.12	1452	1,452	21	26	21
Total L.Moment Aft				79406 A	79,406A						
TOTALS	3,279	3279					28845	28,845	373	1,494	1459

DIESEL OIL (Specific Gravity = 0.870)

TANK	Weight - Tonnes		LCG (M)	L.Moment		VCG (M)	V.Moment		Free Surface		
	98%	Actual		Actual	98%		Actual	98%	98%	Slack	Actual
DIESEL OIL T. P	73.9	73.9	66.28A	4898 A	4,898A	1.56	115	115	238	267	267
DIESEL OIL T. S	86.1	86.1	69.36A	5972 A	5,972A	1.52	131	131	86	93	93
D.O. SETT. T.	20.1	20.1	67.30A	1353 A	1,353A	13.06	263	263	4	4	4
D.O. SERV. T.	19.8	19.8	67.28A	1332 A	1,332A	16.62	329	329	4	4	4
TOTALS	200	200		13555 A	13,555A		838	838	332	368	368

FRESH WATER (Specific Gravity = 1.000)

TANK	Weight - Tonnes		LCG (M)	L.Moment		VCG (M)	V.Moment		Free Surface	
	100%	Actual		Actual	100%		Actual	100%	Slack	Apply
NO.1 POT. W.T. P	116.5	116.5	96.62F	11256 F	11,256F	17.44	2032	2,032	219	219
NO.1 POT. W.T. S	116.5	116.5	96.62F	11256 F	11,256F	17.44	2032	2,032	219	219
Total L.Moment Fwd				22512 F	22,512F					
NO.2 POT. W.T.	111.4	111.4	73.09A	8142 A	8,142A	14.95	1665	1,665	14	14
DIST. W.T.	30.6	30.6	80.10A	2451 A	2,451A	13.51	413	413	5	5
Total L.Moment Aft				10593 A	10,593A					
TOTALS	375	375					6142	6,142	457	457

* Use Tank VCG Tables on page 13. Determine the VCG by rounding off the weight to the next highest 100 tonnes. Interpolation is not necessary.

TS-4

SAMPLE

SALT WATER BALLAST, MISCELLANEOUS TANKS Date__________

SALT WATER BALLAST (Specific Gravity = 1.025)

TANK	Weight - Tonnes		LCG (M)	L.Moment		VCG* (M)	V.Moment		Free Surface	
	100%	Actual		Actual	100%		Actual	100%	Slack	Apply
DEEP W.B.T.	380.7	0	110.28F	0 F	41,984F		0	3,514	371	0
NO.1 BTM. W.B.T.	1,565.3	1565.3	76.10F	119119 F	119,119F	3.92	6136	6,136	9,422	
NO.2 F. W.B.T. P	565.8	0	55.07F	0 F	31,159F		0	4,028	287	
NO.2 F. W.B.T. S	565.8		55.07F	F	31,159F			4,028	287	
NO.2 A. W.B.T. P	789.1		40.20F	F	31,722F			5,232	1,131	
NO.2 A. W.B.T. S	790.0		40.24F	F	31,790F			5,238	1,138	
NO.3 BTM. W.B.T. P	412.7		16.74F	F	6,909F	0.98		404	2,503	
NO.3 BTM. W.B.T. S	412.7		16.74F	F	6,909F	0.98		404	2,503	
Total L.Moment Fwd				119119 F	300,751F					
NO.4 F.W. W.B.T. P	480.8	0	3.83A	0 A	1,837A		0	4,140	23	0
NO.4 F.W. W.B.T. S	480.8		3.83A	A	1,837A			4,140	23	
NO.4 BTM. W.B.T. P	623.6		12.19A	A	7,602A	0.92		574	4,995	
NO.4 BTM. W.B.T. S	623.6		12.19A	A	7,602A	0.92		574	4,995	
NO.4 A.W. W.B.T. P	605.6		18.56A	A	11,240A			5,184	28	
NO.4 A.W. W.B.T. S	605.6		18.56A	A	11,240A			5,184	28	
NO.5 BTM. W.B.T. P	531.7		40.47A	A	21,518A	0.96		510	3,932	
NO.5 BTM. W.B.T. S	531.7		40.47A	A	21,518A	0.96		510	3,932	
NO.5 WING W.B.T. P	566.6		34.50A	A	19,548A			4,901	27	
NO.5 WING W.B.T. S	566.6		34.50A	A	19,548A			4,901	27	
NO.6 WING W.B.T. P	580.2		91.13A	A	52,874A			5,843	828	
NO.6 WING W.B.T. S	580.2		91.13A	A	52,874A			5,843	828	
AFT PEAK T. P	453.4		118.16A	A	53,574A			5,495	2,982	
AFT PEAK T. S	462.0		118.29A	A	54,650A			5,604	3,115	
ANTI-HEELING T. P	615.9		49.83A	A	30,690A			5,007	158	
ANTI-HEELING T. S	615.9		49.83A	A	30,690A			5,007	158	
Total L.Moment Aft				0 A	398,842A					
TOTALS	14,406	1565					6136	92,401	43,721	0

MISCELLANEOUS TANKS (Specific Gravity = 1.000)

TANK	Weight - Tonnes		LCG (M)	L.Moment		VCG (M)	V.Moment		Free Surface	
	100%	Actual		Actual	100%		Actual	100%	Slack	Apply
SOOT CLEAN WATER T.	40.9	0	78.41A	0 A	3,207A	9.57	0	391	9	0
CLEAN DRAIN T.	17.8		78.14A	A	1,391A	1.68		30	6	
WASTE OIL T.	17.8		65.60A	A	1,168A	2.01		36	36	
BILGE T.	62.4		87.13A	A	5,437A	1.41		88	153	
TOTALS	139	0		0 A	11,203A		0	545	204	0

* Use Tank VCG Tables on page 13. Determine the VCG by rounding off the weight to the next highest 100 tonnes. Interpolation is not necessary.

TS-5
DAILY CALCULATION*

SAMPLE

Voyage______ Departure Port______ Arrival Port______ Date______

Item	Weight Tonnes	VCG (M)	V.Moment (MT)	F.S.M. (MT)	Drafts** Fwd	Drafts** Aft
1. Previous Entry	37873		510677	2346	7.92	8.32
2. ±Weight Changes: Fuel Oil Tank				F.S.M. Change ***		
Tank No.3 F.W. P	-40	8.57	-343	15	-0.02	0.00
Tank No.3 F.W. S	-40	8.57	-343	15	-0.02	0.00
S.W. Ballast Tank						
Tank						
Other						
3. Present Condition	37793 a	13.49 b	509991 c	2376 d	7.88 e	8.32 f

STABILITY CALCULATION		FUEL OIL CONSUMPTION	
4. Trim in Meters (3f) - (3e)	0.44 F/A	15. Tonnes Consumed	80 (See above)
6. Change in KM (Hydrostatics) $0.089 \times \frac{0.44}{2.0}$	0.02	16. Tonnes/Day	80.
		17. Miles steamed	492
		18. Tonnes/Mile	0.163
7. KM at Even Keel Draft (Hydrostatics)	15.83		
8. KM Corrected If (4) is (F) then (7) - (6) If (4) is (A) then (7) + (6)	15.85		
9. KG (3b) = (3c) ÷ (3a)	13.49		
10. GM Uncorrected (8) - (9)	2.36		
11. F.S. Correction (3d) ÷ (3a)	0.06		
12. GM Corrected (10) - (11)	2.30		
13. GM Required	0.90		

Notes:
* Use this form for at-sea conditions only. Use the "Arrival Calculation" for predicting your condition upon arrival since it provides a more accurate calculation of drafts

** Obtain draft changes from pages 34, 35 or 36. The algebraic sums in lines (3e) and (3f) represent your approximate present draft.

*** Enter the change in free surface, i.e. from 98%-5° to slack, from slack to empty, etc.

TS-6
ARRIVAL CALCULATION

SAMPLE

Voyage______ Departure Port______ Arrival Port______ Date______

Item	Weight Tonnes	L.Moment Fwd (MT)	L.Moment Aft (MT)	VCG (M)	V.Moment (MT)	F.S.M. (MT)
Departure Condition	37873	471398	742021	13.48	510677	2346
±Weight Changes since departure:						
FO Tank No.3 F.W. P	-450	-11600			-3859	-22
FO Tank No.3 F.W. S	-450	-11600			-3859	-22
FO Tank No.3 A.W. P	-548	-5993			-4810	-27
FO Tank No.3 A.W. S	-548	-5993			-4810	-27
FO Tank DEEP P	-316		-19596	7.88	-2490	–
FO Tank DEEP S	-323		-20294	8.26	-2668	–
DO Tank P	-66		-4374	1.56	-103	–
DO Tank S	-78		-5410	1.52	-119	–
DO Tank						
SW Tank No.3 BTM. P	+413	+6909			+404	0
SW Tank No.3 BTM. S	+413	+6909			+404	0
SW Tank						
FW Tank No.1 P.W. P	-105	-10145		17.44	-1831	–
FW Tank No.1 P.W. S	-105	-10145		17.44	-1831	–
FW Tank No.2 P.W.	-100		-7309	14.95	-1495	–
1. Total at Arrival	35610 a	429740 b	685038 c	13.58 d	483610 e	2248 f

Item	Value	Item	Value
2. Even Keel Draft (Hydrostatics)	7.75	18. Change in KM $0.110 \times \frac{0.43}{2.0}$ (Hydrostatics)	0.02
3. L.Mom. for Trim (1c) - (1b) If (-) then F, if (+) then A	255298 F/A		
4. LCG (3) ÷ (1a)	7.17	19. KM at Even Keel Draft (Hydrostatics)	16.03
5. LCB (Hydrostatics)	6.37 F/A		
6. Trim Lever (4) - (5) If (-) then F, if (+) then A	0.80 F/A	20. KM Corrected If (9) is (F) then (19) - (18) If (9) is (A) then (19) + (18)	16.05
7. Trim Moment (1a) x (6)	28488 F/A		
8. Moment to Trim one Meter (Hydrostatics)	66769		
9. Trim in Meters (7) ÷ (8)	0.43 F/A	21. KG (1d) = (1e) ÷ (1a)	13.58
10. Change in Draft Fwd per Meter of Trim (Hydrostatics)	0.52	22. GM uncorrected (20) - (21)	2.47
		23. F.S. Correction (1f) ÷ (1a)	0.06
11. Draft Change Fwd (9) x (10)	0.22	24 GM Corrected (22) - (23)	2.41
12. Draft at Fwd Marks If (9) is (F) then (2) + (11) If (9) is (A) then (2) - (11)	7.53	25. GM Required	1.00
13. Change in Draft Aft per Meter of Trim (Hydrostatics)	0.47		
14. Draft Change Aft (9) x (13)	0.20		
15. Draft at Aft Marks If (9) is (F) then (2) - (14) If (9) is (A) then (2) + (14)	7.95		
16. Mean Draft [(12) + (15)] ÷ 2	7.74		

CALCULATION FOR WIND HEEL REQUIRED GMt
(For Cases Other Than Those Given on p. 16)

SAMPLE

DEPARTURE PORT: ______ VOYAGE: ______

DESTINATION PORT: ______ DATE: ______

Base Condition: 3 High Containers on Deck

Use the Table which corresponds to this Base condition.
:p. 17 & 18 when all rows are stacked at least 1-high.
:p. 19 & 20 when all rows are stacked at least 2-high.
:p. 21 & 22 when all rows are stacked at least 3-high.
:p. 23 when all rows are stacked at least 4-high.

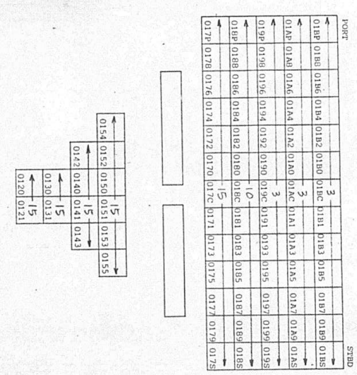
	DEPARTURE	DAILY	ARRIVAL
① LCF Draft	8.13 M	8.12 M	7.75 M
② Draft ① rounded UP to the nearest integer	9.0 M	9.0 M	8.0 M
③ Base Condition GMt Required at Draft ② (read from table, pp. 17, 18, 19, 20, 21, 22 or 23)	0.58 M	0.58 M	0.71 M
④ Draft ① rounded DOWN to the nearest integer	8.0 M	8.0 M	7.0 M
⑤ Base Condition GMt Required at Draft ④ (read from table, pp. 17, 18, 19, 20, 21, 22 or 23)	0.71 M	0.71 M	0.88 M
⑥ GMt Adjustment = [②-①] x [⑤-③]	0.11 M	0.11 M	0.04 M
⑦ Base Condition GMt ① = ③ + ⑥	0.69 M	0.69 M	0.75 M

READ ADJUSTMENT FACTORS USING DRAFT ④ (pp. 17, 18, 19, 20, 21, 22 or 23)

ROW	NO. OF TIERS IN ROW	DEPARTURE ADJUSTMENT FACTOR	DAILY ADJUSTMENT FACTOR	ARRIVAL ADJUSTMENT FACTOR
1	5	1.7251	1.7251	1.7567
2	5	1.7251	1.7251	1.7567
4	5	1.7251	1.7251	1.7567
5	5	1.7251	1.7251	1.7567
7	5	1.7251	1.7251	1.7567
8	5	1.7251	1.7251	1.7567
9	5	1.7251	1.7251	1.7567
10	5	1.7251	1.7251	1.7567
11	5	1.7251	1.7251	1.7567
12	5	1.7251	1.7251	1.7567
13	4	0.3769	0.3769	0.3847
14	3	–	–	–
15	5	1.7251	1.7251	1.7567
16	5	1.7251	1.7251	1.7567
17	3	–	–	–

	DEPARTURE	DAILY	ARRIVAL
⑧ SUM OF FACTORS	21.0781	21.0781	21.4651
⑨ Read P / (Tan θ x Displ.) Factor at Draft ④ (pp. 17, 18, 19, 20, 21, 22 or 23)	0.009736 M	0.009736 M	0.01152 M
⑩ WIND HEEL REQUIRED GMt = ⑦ + [⑧ x ⑨] =	0.90 M	0.90 M	1.00 M

ROW 1 CONTAINER STOWAGE - 40'/45' CONTAINERS

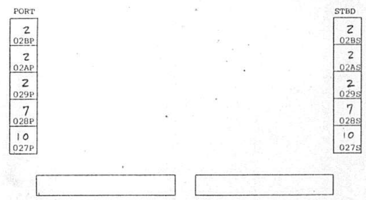


Tier No.	No. Cont.	Tier Wgt. M. Tons	VCG (M) 40'/45'	VCG (M) 40'	V. Moment (MT)
B	13	39	33.95	33.34	1300
A	13	39	31.01	30.58	1193
9	13	39	28.07	27.81	1085
8	13	130	25.12	25.04	3255
7	13	195	22.27	22.27	4343
Total 40'S/45'S Abv. Dk.	65	442			11176

Tier No.	No. Cont.	Tier Wgt. M. Tons	VCG (M) 40'	V. Moment (MT)
5	6	90	16.34	1471
4	4	60	13.69	821
3	2	30	11.09	333
2	2	30	8.35	251
Total 40'S Blw. Dk.	14	210		2876

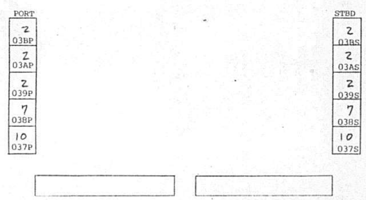
1156

ROW 2 CONTAINER STOWAGE 20' CONTAINERS



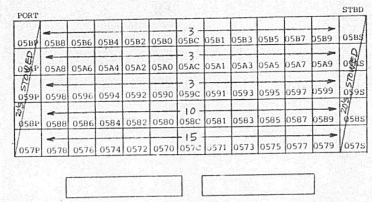
Tier No.	No. Cont.	Tier Wgt. M. Tons	VCG (M) 20'	V. Moment (MT)
B	2	4	32.65	131
A	2	4	30.04	120
9	2	4	27.43	110
8	2	14	24.81	347
7	2	20	22.20	444
Total 20'S Abv. Dk.	10	46		1152

ROW 3 CONTAINER STOWAGE 20' CONTAINERS



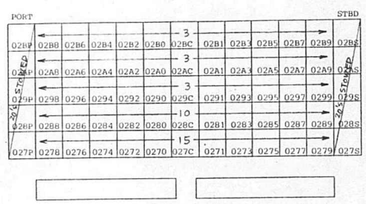
Tier No.	No. Cont.	Tier Wgt. M. Tons	VCG (M) 20'	V. Moment (MT)
B	2	4	32.65	131
A	2	4	30.04	120
9	2	4	27.43	110
8	2	14	24.81	347
7	2	20	22.20	444
Total 20'S Abv. Dk.	10	46		1152

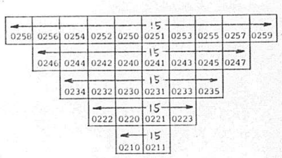
ROW 5 CONTAINER STOWAGE 40'/45' CONTAINERS



Tier No.	No. Cont.	Tier Wgt. M. Tons	VCG (M) 40'	VCG (M) 45'	V. Moment (MT)
B	~~13~~/11	33	33.34	34.11	1100
A	~~13~~/11	33	30.58	31.17	1009
9	~~13~~/11	33	27.81	28.23	918
8	~~13~~/11	110	25.04	25.29	2754
7	~~13~~/11	165	22.27	23.35	3675
Total 40'S/45'S Abv. Dk.	~~65~~/55	374			9456

ROW 2 CONTAINER STOWAGE 40'/45' CONTAINERS

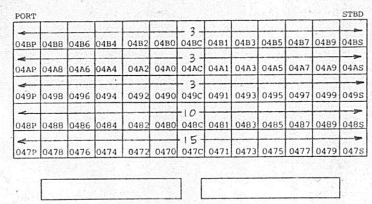


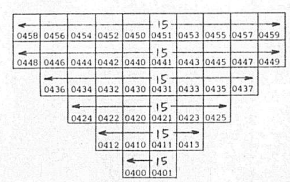


Tier No.	No. Cont.	Tier Wgt. M. Tons	VCG (M) 40'	VCG (M) 45'	V. Moment (MT)
B	~~13~~/11	33	33.34	34.11	1100
A	~~13~~/11	33	30.58	31.17	1009
9	~~13~~/11	33	27.81	28.23	918
8	~~13~~/11	110	25.04	25.29	2754
7	~~13~~/11	165	22.27	22.35	3675
Total 40'S/~~45'S~~ Abv. Dk.	~~65~~/55	374			9456

Tier No.	No. Cont.	Tier Wgt. M. Tons	VCG (M) 40'	V. Moment (MT)
5	10	150	16.44	2466
4	8	120	13.77	1652
3	6	90	11.10	999
2	4	60	8.43	506
1	2	30	5.76	173
Total 40'S Blw. Dk.	30	450		5796

ROW 4 CONTAINER STOWAGE 40'/45' CONTAINERS





Tier No.	No. Cont.	Tier.Wgt. M. Tons	VCG (M) 40'/45'	VCG (M) 40'	V. Moment (MT)
B	13	39	33.95	33.34	1300
A	13	39	31.01	30.58	1193
9	13	39	28.07	27.81	1085
8	13	130	25.12	25.04	3255
7	13	195	22.27	22.27	4343
Total 40'S/~~45'S~~ Abv. Dk.	65	442			11176

Tier No.	No. Cont.	Tier Wgt. M. Tons	VCG (M) 40'	V. Moment (MT)
5	10	150	16.59	2489
4	10	150	13.84	2076
3	8	120	11.17	1340
2	6	90	8.50	765
1	4	60	5.83	350
0	2	30	3.15	95
Total 40'S Blw. Dk.	40	600		7115

ROW 6 CONTAINER STOWAGE 20' CONTAINERS

PORT	STBD
2 06BP	2 06BS
2 06AP	2 06AS
2 069P	2 069S
7 068P	7 068S
10 067P	10 067S

← 10 →									
0668	0666	0664	0662	0660	0661	0663	0665	0667	0669
0658	0656	0654	0652	0650	0651	0653	0655	0657	0659
0648	0648	0644	0642	0640	0641	0643	0645	0647	0649
0638	0636	0634	0632	0630	0631	0633	0635	0637	0639
0628	0626	0624	0622	0620	0621	0623	0625	0627	0629
		0614	0612	0610	0611	0613	0615		
			0602	0600	0601	0603			

(each row: ← 10 →)

Tier No.	No. Cont.	Tier Wgt. M. Tons	VCG (M) 20'	V. Moment (MT)
B	2	4	32.65	131
A	2	4	30.04	120
9	2	4	27.43	110
8	2	14	24.81	347
7	2	20	22.20	444
Total 20'S Abv. Dk.	10	46		1152
			20'	
6	10	100	18.63	1863
5	10	100	16.04	1604
4	10	100	13.45	1345
3	10	100	10.85	1085
2	10	100	8.26	826
1	6	60	5.67	340
0	4	40	3.08	123
Total 20'S Blw. Dk.	60	600		7186

ROW 8 CONTAINER STOWAGE 40'/45' CONTAINERS

PORT												STBD
← 3 →												
08BP	08B8	08B6	08B4	08B2	08B0	08BC	08B1	08B3	08B5	08B7	08B9	08BS
← 3 →												
08AP	08A8	08A6	08A4	08A2	08A0	08AC	08A1	08A3	08A5	08A7	08A9	08AS
← 3 →												
089P	0898	0896	0894	0892	0890	089C	0891	0893	0895	0897	0899	089S
← 10 →												
088P	0888	0886	0884	0882	0880	088C	0881	0883	0885	0887	0889	088S
← 15 →												
087P	0878	0876	0874	0872	0870	087C	0871	0873	0875	0877	0879	087S

← 17 →								
0858	0856	0854	0852	0850	0851	0853	0855	0857
0848	0846	0844	0842	0840	0841	0843	0845	0847
0838	0836	0834	0832	0830	0831	0833	0835	0837
0828	0826	0824	0822	0820	0821	0823	0825	0827
0818	0816	0814	0812	0810	0811	0813	0815	0817
	0806	0804	0802	0800	0801	0803	0805	

(each row: ← 17 →)

Tier No.	No. Cont.	Tier Wgt. M. Tons	VCG (M) 40'	VCG (M) 45'	V. Moment (MT)
B	13	39	33.34	34.11	1300
A	13	39	30.58	31.17	1193
9	13	39	27.81	28.23	1085
8	13	130	25.04	25.29	3255
7	13	195	22.27	22.35	4343
Total 40'S/~~45'S~~ Abv. Dk.	65	442			11176
			45'		
5	10	170	17.77		3021
4	10	170	14.85		2525
3	10	170	11.93		2028
2	10	170	9.01		1532
1	10	170	6.09		1035
0	8	136	3.23		439
Total 45'S Blw. Dk.	58	986			10580

ROW 5 CONTAINER STOWAGE 20' CONTAINERS

PORT	STBD
2 05BP	2 05BS
2 05AP	2 05AS
2 059P	2 059S
7 058P	7 058S
10 057P	10 057S

← 10 →									
0568	0566	0564	0562	0560	0561	0563	0565	0567	0569
0558	0556	0554	0552	0550	0551	0553	0555	0557	0559
0548	0546	0544	0542	0540	0541	0543	0545	0547	0549
0538	0536	0534	0532	0530	0531	0533	0535	0537	0539
0528	0526	0524	0522	0520	0521	0523	0525	0527	0529
		0514	0512	0510	0511	0513	0515		
			0502	0500	0501	0503			

(each row: ← 10 →)

Tier No.	No. Cont.	Tier Wgt. M. Tons	VCG (M) 20'	V. Moment (MT)
B	2	4	32.65	131
A	2	4	30.04	120
9	2	4	27.43	110
8	2	14	24.81	347
7	2	20	22.20	444
Total 20'S Abv. Dk.	10	46		1152
			20'	
6	10	100	18.63	1863
5	10	100	16.04	1604
4	10	100	13.45	1345
3	10	100	10.85	1085
2	10	100	8.26	826
1	6	60	5.67	340
0	4	40	3.08	123
Total 20'S Blw. Dk.	60	600		7186

ROW 7 CONTAINER STOWAGE 40'/45' CONTAINERS

PORT												STBD
← 3 →												
07BP	07B8	07B6	07B4	07B2	07B0	07BC	07B1	07B3	07B5	07B7	07B9	07BS
← 3 →												
07AP	07A8	07A6	07A4	07A2	07A0	07AC	07A1	07A3	07A5	07A7	07A9	07AS
← 3 →												
079P	0798	0796	0794	0792	0790	079C	0791	0793	0795	0797	0799	079S
← 10 →												
078P	0788	0786	0784	0782	0780	078C	0781	0783	0785	0787	0789	078S
← 15 →												
077P	0778	0776	0774	0772	0770	077C	0771	0773	0775	0777	0779	077S

← 15 →									
0758	0756	0754	0752	0750	0751	0753	0755	0757	0759
0748	0746	0744	0742	0740	0741	0743	0745	0747	0749
0738	0736	0734	0732	0730	0731	0733	0735	0737	0739
0728	0726	0724	0722	0720	0721	0723	0725	0727	0729
	0716	0714	0712	0710	0711	0713	0715	0717	
		0704	0702	0700	0701	0703	0705		

(each row: ← 15 →)

Tier No.	No. Cont.	Tier Wgt. M. Tons	VCG (M) 40'/45'	VCG (M) 40'	V. Moment (MT)
B	13	39	33.95	33.34	1300
A	13	39	31.31	30.58	1193
9	13	39	28.07	27.81	1085
8	13	130	25.12	25.04	3255
7	13	195	22.27	22.27	4343
Total 40'S/~~45'S~~ Abv. Dk.	65	442			11176
			40'		
5	10	150	16.87		2531
4	10	150	14.13		2120
3	10	150	11.38		1707
2	10	150	8.64		1296
1	8	120	5.90		708
0	6	90	3.15		284
Total 40'S Blw. Dk.	54	810			8646

1158

ROW 10 CONTAINER STOWAGE 40'/45' CONTAINERS

Stack	PORT												STBD
← 3 →	10BP	10B8	10B6	10B4	10B2	10B0	10BC	10B1	10B3	10B5	10B7	10B9	10BS
← 3 →	10AP	10A8	10A6	10A4	10A2	10A0	10AC	10A1	10A3	10A5	10A7	10A9	10AS
← 3 →	109P	1098	1096	1094	1092	1090	109C	1091	1093	1095	1097	1099	109S
← 10 →	108P	1088	1086	1084	1082	1080	108C	1081	1083	1085	1087	1089	108S
← 15 →	107P	1078	1076	1074	1072	1070	107C	1071	1073	1075	1077	1079	107S

Tier No.	No. Cont.	Tier Wgt. M. Tons	VCG (M) 40'	VCG (M) 45'	V. Moment (MT)
B	13	39	33.34	34.11	1300
A	13	39	30.58	31.17	1193
9	13	39	27.81	28.23	1085
8	13	130	25.04	25.29	3255
7	13	195	22.27	22.35	4343
Total 40'S/~~45'S~~ Abv. Dk.	65	442			11176

Stack										
← 17 →	1058	1056	1054	1052	1050	1051	1053	1055	1057	1059
← 17 →	1048	1046	1044	1042	1040	1041	1043	1045	1047	1049
← 17 →	1038	1036	1034	1032	1030	1031	1033	1035	1037	1039
← 17 →	1028	1026	1024	1022	1020	1021	1023	1025	1027	1029
← 17 →	1018	1016	1014	1012	1010	1011	1013	1015	1017	1019
← 17 →	1008	1006	1004	1002	1000	1001	1003	1005	1007	1009

Tier No.	No. Cont.	Tier Wgt. M. Tons	45'	V. Moment (MT)
5	10	170	17.77	3021
4	10	170	14.85	2525
3	10	170	11.93	2028
2	10	170	9.01	1532
1	10	170	6.09	1035
0	10	170	3.23	549
Total 45' Blw. Dk.	60	1020		10690

ROW 12 CONTAINER STOWAGE 40'/45' CONTAINERS

Stack	PORT												STBD
← 3 →	12BP	12B8	12B6	12B4	12B2	12B0	12BC	12B1	12B3	12B5	12B7	12B9	12BS
← 3 →	12AP	12A8	12A6	12A4	12A2	12A0	12AC	12A1	12A3	12A5	12A7	12A9	12AS
← 3 →	129P	1298	1296	1294	1292	1290	129C	1291	1293	1295	1297	1299	129S
← 10 →	128P	1288	1286	1284	1282	1280	128C	1281	1283	1285	1287	1289	128S
← 15 →	127P	1278	1276	1274	1272	1270	127C	1271	1273	1275	1277	1279	127S

Tier No.	No. Cont.	Tier Wgt. M. Tons	VCG (M) 40'/45'	VCG (M) 40'	V. Moment (MT)
B	13	39	33.95	33.34	1300
A	13	39	31.01	30.58	1193
9	13	39	28.07	27.81	1085
8	13	130	25.12	25.04	3255
7	13	195	22.27	22.27	4343
Total 40'S/~~45'S~~ Abv. Dk.	65	442			11176

Stack										
← 15 →	1258	1256	1254	1252	1250	1251	1253	1255	1257	1259
← 15 →	1248	1246	1244	1242	1240	1241	1243	1245	1247	1249
← 15 →	1238	1236	1234	1232	1230	1231	1233	1235	1237	1239
← 15 →	1228	1226	1224	1222	1220	1221	1223	1225	1227	1229
← 15 →	1218	1216	1214	1212	1210	1211	1213	1215	1217	1219
← 15 →		1206	1204	1202	1200	1201	1203	1205	1207	

Tier No.	No. Cont.	Tier Wgt. M. Tons	40'	V. Moment (MT)
5	10	150	16.87	2531
4	10	150	14.12	2118
3	10	150	11.38	1707
2	10	150	8.64	1296
1	10	150	5.90	885
0	8	120	3.15	378
Total 40'S Blw. Dk.	58	870		8915

ROW 9 CONTAINER STOWAGE 40'/45' CONTAINERS

Stack	PORT												STBD
← 3 →	09BP	09B8	09B6	09B4	09B2	09B0	09BC	09B1	09B3	09B5	09B7	09B9	09BS
← 3 →	09AP	09A8	09A6	09A4	09A2	09A0	09AC	09A1	09A3	09A5	09A7	09A9	09AS
← 3 →	099P	0998	0996	0994	0992	0990	099C	0991	0993	0995	0997	0999	099S
← 10 →	098P	0988	0986	0984	0982	0980	098C	0981	0983	0985	0987	0989	098S
← 15 →	097P	0978	0976	0974	0972	0970	097C	0971	0973	0975	0977	0979	097S

Tier No.	No. Cont.	Tier Wgt. M. Tons	VCG (M) 40'/45'	VCG (M) 40'	V. Moment (MT)
B	13	39	33.95	33.34	1300
A	13	39	31.01	30.58	1193
9	13	39	28.07	27.81	1085
8	13	130	25.12	25.04	3255
7	13	195	22.27	22.27	4343
Total 40'S/~~45'S~~ Abv. Dk.	65	442			11176

Stack										
← 15 →	0958	0956	0954	0952	0950	0951	0953	0955	0957	0959
← 15 →	0948	0946	0944	0942	0940	0941	0943	0945	0947	0949
← 15 →	0938	0936	0934	0932	0930	0931	0933	0935	0937	0939
← 15 →	0928	0926	0924	0922	0920	0921	0923	0925	0927	0929
← 15 →	0918	0916	0914	0912	0910	0911	0913	0915	0917	0919
← 15 →	0908	0906	0904	0902	0900	0901	0903	0905	0907	0909

Tier No.	No. Cont.	Tier Wgt. M. Tons	40'	V. Moment (MT)
5	10	150	16.87	2531
4	10	150	14.12	2118
3	10	150	11.38	1707
2	10	150	8.64	1296
1	10	150	5.90	885
0	10	150	3.15	473
Total 40'S Blw. Dk.	60	900		9010

ROW 11 CONTAINER STOWAGE 40'/45' CONTAINERS

Stack	PORT												STBD
← 3 →	11BP	11B8	11B6	11B4	11B2	11B0	11BC	11B1	11B3	11B5	11B7	11B9	11BS
← 3 →	11AP	11A8	11A6	11A4	11A2	11A0	11AC	11A1	11A3	11A5	11A7	11A9	11AS
← 3 →	119P	1198	1196	1194	1192	1190	119C	1191	1193	1195	1197	1199	119S
← 10 →	118P	1188	1186	1184	1182	1180	118C	1181	1183	1185	1187	1189	118S
← 15 →	117P	1178	1176	1174	1172	1170	117C	1171	1173	1175	1177	1179	117S

Tier No.	No. Cont.	Tier Wgt. M. Tons	VCG (M) 40'/45'	VCG (M) 40'	V. Moment (MT)
B	13	39	33.95	33.34	1300
A	13	39	31.01	30.58	1193
9	13	39	28.07	27.81	1085
8	13	130	25.12	25.04	3255
7	13	195	22.27	22.27	4343
Total 40'S/~~45'S~~ Abv. Dk.	65	442			11176

Stack										
← 15 →	1158	1156	1154	1152	1150	1151	1153	1155	1157	1159
← 15 →	1148	1146	1144	1142	1140	1141	1143	1145	1147	1149
← 15 →	1138	1136	1134	1132	1130	1131	1133	1135	1137	1139
← 15 →	1128	1126	1124	1122	1120	1121	1123	1125	1127	1129
← 15 →	1118	1116	1114	1112	1110	1111	1113	1115	1117	1119
← 15 →	1108	1106	1104	1102	1100	1101	1103	1105	1107	1109

Tier No.	No. Cont.	Tier Wgt. M. Tons	40'	V. Moment (MT)
5	10	150	16.87	2531
4	10	150	14.12	2118
3	10	150	11.38	1707
2	10	150	8.64	1296
1	10	150	5.90	885
0	10	150	3.15	473
Total 40'S Blw. Dk.	60	900		9010

ROW 15 CONTAINER STOWAGE 40'/45' CONTAINERS

PORT — STBD

← 3 →	15BP	15B8	15B6	15B4	15B2	15B0	15BC	15B1	15B3	15B5	15B7	15B9	15BS
← 3 →	15AP	15A8	15A6	15A4	15A2	15A0	15AC	15A1	15A3	15A5	15A7	15A9	15AS
← 3 →	159P	1598	1596	1594	1592	1590	159C	1591	1593	1595	1597	1599	159S
← 10 →	158P	1588	1586	1584	1582	1580	158C	1581	1583	1585	1587	1589	158S
← 15 →	157P	1578	1576	1574	1572	1570	157C	1571	1573	1575	1577	1579	157S

← 15 →	1558	1556	1554	1552	1550	1551	1553	1555	1557	1559
← 15 →	1548	1546	1544	1542	1540	1541	1543	1545	1547	1549
← 15 →		1536	1534	1532	1530	1531	1533	1535	1537	

Tier No.	No. Cont.	Tier Wgt. M. Tons	VCG (M) 40'/45'	VCG (M) 40'	V. Moment (MT)
B	13	39	33.95	33.34	1300
A	13	39	31.01	30.58	1193
9	13	39	28.07	27.81	1085
8	13	130	25.12	25.04	3255
7	13	195	22.27	22.27	4343
Total 40'S/~~45'S~~ Abv. Dk.	65	442			11176

Tier No.	No. Cont.	Tier Wgt. M. Tons	VCG (M) 40'	V. Moment (MT)
5	10	150	16.39	2459
4	10	150	13.65	2048
3	8	120	10.93	1312
Total 40'S Blw. Dk.	28	420		5819

ROW 13 CONTAINER STOWAGE 20' CONTAINERS

PORT — STBD

← 2 →	13AP	13A8	13A6	13A4	13A2	13A0	13A1	13A3	13A5	13A7	13A9	13AS
← 2 →	139P	1398	1396	1394	1392	1390	1391	1393	1395	1397	1399	139S
← 7 →	138P	1388	1386	1384	1382	1380	1381	1383	1385	1387	1389	138S
← 10 →		1378	1376	1374	1372	1370	1371	1373	1375	1377	1379	

Tier No.	No. Cont.	Tier Wgt. M. Tons	VCG (M) 20'	V. Moment (MT)
A	12	24	28.03	673
9	12	24	25.44	611
8	12	84	22.85	1919
7	10	100	20.26	2026
Total 20'S Row #13	46	232		5229

ROW 14 CONTAINER STOWAGE 40' CONTAINERS

PORT — STBD

← 3 →	149P	1498	1496	1494	1492	1490	1491	1493	1495	1497	1499	149S
← 10 →	148P	1488	1486	1484	1482	1480	1481	1483	1485	1487	1489	148S
← 15 →		1478	1476	1474	1472	1470	1471	1473	1475	1477	1479	

Tier No.	No. Cont.	Tier Wgt. M. Tons	VCG (M) 40'	V. Moment (MT)
9	12	36	25.85	931
8	12	120	23.11	2773
7	10	150	20.36	3054
Total 40'S Row #14	34	306		6758

ROW 17 CONTAINER STOWAGE 40' CONTAINERS

PORT — STBD (20'S STOWED)

178P	1788	1786	1784	1782	1780	1781	1783	1785	1787	1789	178S
177P	1778	1776	1774	1772	1770	1771	1773	1775	1777	1779	177S

Tier No.	No. Cont.	Tier Wgt. M. Tons	VCG (M) 40'	V. Moment (MT)
8	12		25.75	
7	12		23.01	
Total 40' Row #17	24			

ROW 17 CONTAINER STOWAGE 20' CONTAINERS

PORT — STBD

← 2 →	179P	1798	1796	1794	1792	1790	1791	1793	1795	1797	1799	179S
← 7 →	178P	1788	1786	1784	1782	1780	1781	1783	1785	1787	1789	178S
← 10 →	177P	1778	1776	1774	1772	1770	1771	1773	1775	1777	1779	177S

Tier No.	No. Cont.	Tier Wgt. M. Tons	VCG (M) 20'	V. Moment (MT)
9	12	24	28.14	675
8	12	84	25.54	2145
7	12	120	22.93	2752
Total 20' Row #17	36	228		5572

ROW 16 CONTAINER STOWAGE 40'/45' CONTAINERS

PORT — STBD

← 3 →	16BP	16B8	16B6	16B4	16B2	16B0	16BC	16B1	16B3	16B5	16B7	16B9	16BS
← 3 →	16AP	16A8	16A6	16A4	16A2	16A0	16AC	16A1	16A3	16A5	16A7	16A9	16AS
← 3 →	169P	1698	1696	1694	1692	1690	169C	1691	1693	1695	1697	1699	169S
← 10 →	168P	1688	1686	1684	1682	1680	168C	1681	1683	1685	1687	1689	168S
← 15 →	167P	1678	1676	1674	1672	1670	167C	1671	1673	1675	1677	1679	167S

← 15 →	1658	1656	1654	1652	1650	1651	1653	1655	1657	1659
← 15 →		1646	1644	1642	1640	1641	1643	1645	1647	

Tier No.	No. Cont.	Tier Wgt. M. Tons	VCG (M) 40'/45'	VCG (M) 40'	V. Moment (MT)
B	13	39	33.95	33.34	1300
A	13	39	31.01	30.58	1193
9	13	39	28.07	27.81	1085
8	13	130	25.12	25.04	3255
7	13	195	22.27	22.27	4343
Total 40'S/~~45'S~~ Abv. Dk.	65	442			11176

Tier No.	No. Cont.	Tier Wgt. M. Tons	VCG (M) 40'	V. Moment (MT)
5	10	150	16.24	2436
4	8	120	13.52	1622
Total 40' Blw. Dk.	18	270		4058

ROW 18 CONTAINER STOWAGE 20' CONTAINERS

PORT ... STBD

189P	1898	1896	1894	1892	1890	1891	1893	1895	1897	1899	189S
←						2					→
188P	1888	1886	1884	1882	1880	1881	1883	1885	1887	1889	188S
←						7					→
187P	1878	1876	1874	1872	1870	1871	1873	1875	1877	1879	187S
←						10					→

Tier No.	No. Cont.	Tier Wgt. M. Tons	VCG (M) 20'	V. Moment (MT)
9	12	24	28.14	675
8	12	84	25.54	2145
7	12	120	22.93	2752
Total 20' Row #18	36	228		5572

CALCULATION FORMS

TS-1

DEPARTURE CALCULATION

Voyage________ Departure Port________ Arrival Port________ Date________

	Weight Tonnes	L.Moment Fwd (MT)	L.Moment Aft (MT)	VCG (M)	V.Moment (MT)	F.S. Moment (MT)
Operating Lightship	17472	------	250244	-----	213418	62
Containers -Sheet TS-2						
Fuel Oil -Sheet TS-3						
Diesel Oil -Sheet TS-3						
Fresh Water-Sheet TS-3						
Salt Water -Sheet TS-4						
Misc. Tanks-Sheet TS-4						
1. Totals	a	b	c	d	e	f

DRAFT AND TRIM CALCULATION		
2. Even Keel Draft (Hydrostatics)		
3. L.Mom. for Trim (1c) - (1b) If (-) then F, if (+) then A		F / A
4. LCG (3) ÷ (1a)		F / A
5. LCB (Hydrostatics)		F / A
6. Trim Lever (4) - (5) If (-) the F, if (+) then A		F / A
7. Trim Moment (1a) x (6)		
8. Moment to Trim One Meter (Hydrostatics)		
9. Trim in Meters (7) ÷ (8)		F / A
10. Change in Draft Fwd per Meter of Trim (Hydrostatics)		
11. Draft Change Fwd (9) x (10)		
12. Draft At Fwd Marks If (9) is (F) then (2) + (11) If (9) is (A) then (2) - (11)		
13. Change in Draft Aft per Meter of Trim (Hydrostatics)		
14. Draft Change Aft (9) x (13)		
15. Draft at Aft Marks If (9) is (F) then (2) - (14) If (9) is (A) then (2) + (14)		
16. Mean Draft [(12) + (15)] ÷ 2		

STABILITY CALCULATION	
18. Change in KM (Hydrostatics)	
19. KM at Even Keel Draft (Hydrostatics)	
20. KM Corrected If (9) is (F) then (19)-(18) If (9) is (A) then (19)+(18)	
21. KG (1d) = (1e) ÷ (1a)	
22. GM Uncorrected (20) - (21)	
23. F.S. Correction (1f) ÷ (1a)	
24. GM Corrected (22) - (23)	
25. GM Required	

Observed	Port	Stbd	Average
Draft Fwd			
Draft Aft			
Midship			
Trim			

TS-2F

CONTAINER STOWAGE SUMMARY
FOR CONTAINER ROWS FWD OF AMIDSHIP

Voyage________ Departure Port________ Arrival Port________ Date________

Row	No. Containers 20's	40's	45's	Weight* Tonnes	V.Moment* (MT)	LCG M - ⊠	Fwd L.Moment (MT)
1 Above Dk	----		----			84.95 F	F
	----	----				84.95 F	F
1 Below Dk	----		----			84.95 F	F
2 Above Dk		----	----			74.19 F	F
	----		----			70.36 F	F
	----	----				70.36 F	F
2 Below Dk	----		----			71.12 F	F
3 Above Dk		----	----			66.53 F	F
4 Above Dk	----		----			55.43 F	F
	----	----				55.43 F	F
4 Below Dk	----		----			55.43 F	F
5 Above Dk		----	----			44.67 F	F
	----		----			40.84 F	F
	----	----				40.84 F	F
5 Below Dk		----	----			44.67 F	F
6 Above Dk		----	----			37.01 F	F
6 Below Dk		----	----			37.01 F	F
7 Above Dk	----		----			25.91 F	F
	----	----				25.91 F	F
7 Below Dk	----		----			25.91 F	F
8 Above Dk	----		----			11.32 F	F
	----	----				11.32 F	F
8 Below Dk	----	----				11.32 F	F
TOTALS FWD							F

* Weight and vertical moment of each row are summed on the Container Stowage Sheets.

LCG's for container stacks aft of amidships are listed on the following page.

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TS-2A

CONTAINER STOWAGE SUMMARY
FOR CONTAINER ROWS AFT OF AMIDSHIP

Voyage__________ Departure Port__________ Arrival Port__________ Date__________

Row	No. Containers			Weight* Tonnes	V.Moment* (MT)	LCG M - ⊠	Aft L.Moment (MT)
	20's	40's	45's				
9 Above Dk	----		----			3.61 A	A
	----	----				3.61 A	A
9 Below Dk	----		----			3.61 A	A
10 Above Dk	----		----			18.20 A	A
	----	----				18.20 A	A
10 Below Dk	----	----				18.20 A	A
11 Above Dk	----		----			33.12 A	A
	----	----				33.12 A	A
11 Below Dk	----		----			33.12 A	A
12 Above Dk	----		----			48.67 A	A
	----	----				48.67 A	A
12 Below Dk	----		----			48.67 A	A
13 Above Dk		----	----			62.54 A	A
14 Above Dk	----		----			72.23 A	A
15 Above Dk	----		----			92.88 A	A
	----	----				92.88 A	A
15 Below Dk	----		----			92.88 A	A
16 Above Dk	----		----			107.13 A	A
	----	----				107.13 A	A
16 Below Dk	----		----			107.13 A	A
17 Above Dk		----	----			118.37 A	A
	----		----			121.75 A	A
18 Above Dk		----	----			125.13 A	A
TOTALS AFT							A
TOTALS FWD							F
TOTALS							

* Weight and vertical moment of each row are summed on the Container Stowage Sheets.

Enter "TOTALS FWD" from the previous sheet.

TS-3

TANK CAPACITIES - FUEL OIL, DIESEL OIL, FRESH WATER Date__________

FUEL OIL (Specific Gravity = 0.9845)

TANK	Weight - Tonnes		LCG (M)	L.Moment		VCG* (M)	V.Moment		Free Surface		
	98%	Actual		Actual	98%		Actual	98%	98%	Slack	Actual
NO.3 F.W. F.O.T. P	450.3		25.76F	F	11,600F			3,859	22	37	
NO.3 F.W. F.O.T. S	450.3		25.76F	F	11,600F			3,859	22	37	
NO.3 A.W. F.O.T. P	547.8		10.94F	F	5,993F			4,810	27	27	
NO.3 A.W. F.O.T. S	547.8		10.94F	F	5,993F			4,810	27	27	
Total L.Moment Fwd				F	35,186F						
DEEP F.O.T. P	461.6		62.01A	A	28,624A			3,637	5	550	
DEEP F.O.T. S	469.1		62.83A	A	29,474A			3,875	11	552	
H.F.O. SETT. T. P	116.4		60.57A	A	7,050A	10.40		1,211	157	157	
H.F.O. SETT. T. S	115.6		60.53A	A	6,997A	11.52		1,332	81	81	
H.F.O. SERV. T.	119.8		60.61A	A	7,261A	12.12		1,452	21	26	
Total L.Moment Aft				A	79,406A						
TOTALS	3,279							28,845	373	1,494	

DIESEL OIL (Specific Gravity = 0.870)

TANK	Weight - Tonnes		LCG (M)	L.Moment		VCG (M)	V.Moment		Free Surface		
	98%	Actual		Actual	98%		Actual	98%	98%	Slack	Actual
DIESEL OIL T. P	73.9		66.28A	A	4,898A	1.56		115	238	267	
DIESEL OIL T. S	86.1		69.36A	A	5,972A	1.52		131	86	93	
D.O. SETT. T.	20.1		67.30A	A	1,353A	13.06		263	4	4	
D.O. SERV. T.	19.8		67.28A	A	1,332A	16.62		329	4	4	
TOTALS	200			A	13,555A			838	332	368	

FRESH WATER (Specific Gravity = 1.000)

TANK	Weight - Tonnes		LCG (M)	L.Moment		VCG (M)	V.Moment		Free Surface	
	100%	Actual		Actual	100%		Actual	100%	Slack	Apply
NO.1 POT. W.T. P	116.5		96.62F	F	11,256F	17.44		2,032	219	219
NO.1 POT. W.T. S	116.5		96.62F	F	11,256F	17.44		2,032	219	219
Total L.Moment Fwd				F	22,512F					
NO.2 POT. W.T.	111.4		73.09A	A	8,142A	14.95		1,665	14	14
DIST. W.T.	30.6		80.10A	A	2,451A	13.51		413	5	5
Total L.Moment Aft				A	10,593A					
TOTALS	375							6,142	457	457

* Use Tank VCG Tables on page 13. Determine the VCG by rounding off the weight to the next highest 100 tonnes. Interpolation is not necessary.

TS-4

SALT WATER BALLAST, MISCELLANEOUS TANKS Date__________

SALT WATER BALLAST (Specific Gravity = 1.025)

TANK	Weight - Tonnes		LCG (M)	L.Moment		VCG* (M)	V.Moment		Free Surface	
	100%	Actual		Actual	100%		Actual	100%	Slack	Apply
DEEP W.B.T.	380.7		110.28F	F	41,984F			3,514	371	
NO.1 BTM. W.B.T.	1,565.3		76.10F	F	119,119F			6,136	9,422	
NO.2 F. W.B.T. P	565.8		55.07F	F	31,159F			4,028	287	
NO.2 F. W.B.T. S	565.8		55.07F	F	31,159F			4,028	287	
NO.2 A. W.B.T. P	789.1		40.20F	F	31,722F			5,232	1,131	
NO.2 A. W.B.T. S	790.0		40.24F	F	31,790F			5,238	1,138	
NO.3 BTM. W.B.T. P	412.7		16.74F	F	6,909F	0.98		404	2,503	
NO.3 BTM. W.B.T. S	412.7		16.74F	F	6,909F	0.98		404	2,503	
Total L.Moment Fwd				F	300,751F					
NO.4 F.W. W.B.T. P	480.8		3.83A	A	1,837A			4,140	23	
NO.4 F.W. W.B.T. S	480.8		3.83A	A	1,837A			4,140	23	
NO.4 BTM. W.B.T. P	623.6		12.19A	A	7,602A	0.92		574	4,995	
NO.4 BTM. W.B.T. S	623.6		12.19A	A	7,602A	0.92		574	4,995	
NO.4 A.W. W.B.T. P	605.6		18.56A	A	11,240A			5,184	28	
NO.4 A.W. W.B.T. S	605.6		18.56A	A	11,240A			5,184	28	
NO.5 BTM. W.B.T. P	531.7		40.47A	A	21,518A	0.96		510	3,932	
NO.5 BTM. W.B.T. S	531.7		40.47A	A	21,518A	0.96		510	3,932	
NO.5 WING W.B.T. P	566.6		34.50A	A	19,548A			4,901	27	
NO.5 WING W.B.T. S	566.6		34.50A	A	19,548A			4,901	27	
NO.6 WING W.B.T. P	580.2		91.13A	A	52,874A			5,843	828	
NO.6 WING W.B.T. S	580.2		91.13A	A	52,874A			5,843	828	
AFT PEAK T. P	453.4		118.16A	A	53,574A			5,495	2,982	
AFT PEAK T. S	462.0		118.29A	A	54,650A			5,604	3,115	
ANTI-HEELING T. P	615.9		49.83A	A	30,690A			5,007	158	
ANTI-HEELING T. S	615.9		49.83A	A	30,690A			5,007	158	
Total L.Moment Aft				A	398,842A					
TOTALS	14,406							92,401	43,721	

MISCELLANEOUS TANKS (Specific Gravity = 1.000)

TANK	Weight - Tonnes		LCG (M)	L.Moment		VCG (M)	V.Moment		Free Surface	
	100%	Actual		Actual	100%		Actual	100%	Slack	Apply
SOOT CLEAN WATER T.	40.9		78.41A	A	3,207A	9.57		391	9	
CLEAN DRAIN T.	17.8		78.14A	A	1,391A	1.68		30	6	
WASTE OIL T.	17.8		65.60A	A	1,168A	2.01		36	36	
BILGE T.	62.4		87.13A	A	5,437A	1.41		88	153	
TOTALS	139			A	11,203A			545	204	

* Use Tank VCG Tables on page 13. Determine the VCG by rounding off the weight to the next highest 100 tonnes. Interpolation is not necessary.

TS-5

DAILY CALCULATION*

Voyage__________ Departure Port__________ Arrival Port__________ Date__________

Item	Weight Tonnes	VCG (M)	V.Moment (MT)	F.S.M. (MT)	Drafts**	
					Fwd	Aft
1. Previous Entry						
2. ±Weight Changes: Fuel Oil Tank				F.S.M. Change ***		
Tank						
Tank						
S.W. Ballast Tank						
Tank						
Other						
3. Present Condition	a	b	c	d	e	f

STABILITY CALCULATION		FUEL OIL CONSUMPTION
4. Trim in Meters (3f) - (3e)	F / A	15. Tonnes Consumed (See above)
6. Change in KM (Hydrostatics)		16. Tonnes/Day
		17. Miles steamed
		18. Tonnes/Mile
7. KM at Even Keel Draft (Hydrostatics)		
8. KM Corrected If (4) is (F) then (7) - (6) If (4) is (A) then (7) + (6)		
9. KG (3b) = (3c) ÷ (3a)		
10. GM Uncorrected (8) - (9)		
11. F.S. Correction (3d) ÷ (3a)		
12. GM Corrected (10) - (11)		
13. GM Required		

Notes:

* Use this form for at-sea conditions only. Use the "Arrival Calculation" for predicting your condition upon arrival since it provides a more accurate calculation of drafts

** Obtain draft changes from pages 34, 35 or 36. The algebraic sums in lines (3e) and (3f) represent your approximate present draft.

*** Enter the change in free surface, i.e. from 98%-5° to slack, from slack to empty, etc.

TS-6

ARRIVAL CALCULATION

Voyage___________ Departure Port___________ Arrival Port___________ Date___________

Item	Weight Tonnes	L.Moment Fwd (MT)	L.Moment Aft (MT)	VCG (M)	V.Moment (MT)	F.S.M. (MT)
Departure Condition						
±Weight Changes since departure: FO Tank						
FO Tank						
FO Tank						
FO Tank						
FO Tank						
DO Tank						
DO Tank						
DO Tank						
SW Tank						
SW Tank						
SW Tank						
1. Total at Arrival	a	b	c	d	e	f

2. Even Keel Draft (Hydrostatics)		18. Change in KM (Hydrostatics)	
3. L.Mom. for Trim (1c) - (1b) If (-) then F, if (+) then A	F A		
4. LCG (3) ÷ (1a)		19. KM at Even Keel Draft (Hydrostatics)	
5. LCB (Hydrostatics)	F/A		
6. Trim Lever (4) - (5) If (-) then F, if (+) then A	F A	20. KM Corrected If (9) is (F) then (19) - (18) If (9) is (A) then (19) + (18)	
7. Trim Moment (1a) x (6)	F/A		
8. Moment to Trim one Meter (Hydrostatics)			
9. Trim in Meters (7) ÷ (8)	F/A	21. KG (1d) = (1e) ÷ (1a)	
10. Change in Draft Fwd per Meter of Trim (Hydrostatics)		22. GM uncorrected (20) - (21)	
		23. F.S. Correction (1f) ÷ (1a)	
11. Draft Change Fwd (9) x (10)		24 GM Corrected (22) - (23)	
12. Draft at Fwd Marks If (9) is (F) then (2) + (11) If (9) is (A) then (2) - (11)		25. GM Required	
13. Change in Draft Aft per Meter of Trim (Hydrostatics)			
14. Draft Change Aft (9) x (13)			
15. Draft at Aft Marks If (9) is (F) then (2) - (14) If (9) is (A) then (2) + (14)			
16. Mean Draft [(12) + (15)] ÷ 2			

CALCULATION FOR WIND HEEL REQUIRED GMt
(For Cases Other Than Those Given on p. 16)

DEPARTURE PORT: __________ VOYAGE: __________

DESTINATION PORT: __________ DATE: __________

Base Condition: ______ High Containers on Deck

Use the Table which corresponds to this Base condition.
:p. 17 & 18 when all rows are stacked at least 1-high.
:p. 19 & 20 when all rows are stacked at least 2-high.
:p. 21 & 22 when all rows are stacked at least 3-high.
:p. 23 when all rows are stacked at least 4-high.

	DEPARTURE	DAILY	ARRIVAL
① LCF Draft	____ M	____ M	____ M
② Draft ① rounded UP to the nearest integer	____ M	____ M	____ M
③ Base Condition GMt Required at Draft ② (read from table, pp. 17, 18, 19, 20, 21, 22 or 23)	____ M	____ M	____ M
④ Draft ① rounded DOWN to the nearest integer	____ M	____ M	____ M
⑤ Base Condition GMt Required at Draft ④ (read from table, pp. 17, 18, 19, 20, 21, 22 or 23)	____ M	____ M	____ M
⑥ GMt Adjustment = [②-①] x [⑤-③]	____ M	____ M	____ M
⑦ Base Condition GMt ① = ③ + ⑥	____ M	____ M	____ M

READ ADJUSTMENT FACTORS USING DRAFT ④ (pp. 17, 18, 19, 20, 21, 22 or 23)

ROW	NO. OF TIERS IN ROW	DEPARTURE ADJUSTMENT FACTOR	DAILY ADJUSTMENT FACTOR	ARRIVAL ADJUSTMENT FACTOR
1				
2				
4				
5				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				

⑧ SUM OF FACTORS	____	____	____
⑨ Read P / (Tan θ x Displ.) Factor at Draft ④ (pp. 17, 18, 19, 20, 21, 22 or 23)	____ M	____ M	____ M
⑩ WIND HEEL REQUIRED GMt = ⑦ + [⑧ x ⑨] =	____ M	____ M	____ M

ROW 1 CONTAINER STOWAGE - 40'/45' CONTAINERS

PORT												STBD
01BP	01B8	01B6	01B4	01B2	01B0	01BC	01B1	01B3	01B5	01B7	01B9	01BS
01AP	01A8	01A6	01A4	01A2	01A0	01AC	01A1	01A3	01A5	01A7	01A9	01AS
019P	0198	0196	0194	0192	0190	019C	0191	0193	0195	0197	0199	019S
018P	0188	0186	0184	0182	0180	018C	0181	0183	0185	0187	0189	018S
017P	0178	0176	0174	0172	0170	017C	0171	0173	0175	0177	0179	017S

0154	0152	0150	0151	0153	0155
	0142	0140	0141	0143	
		0130	0131		
		0120	0121		

Tier No.	No. Cont.	Tier Wgt. M. Tons	VCG (M) 40'/45'	VCG (M) 40'	V. Moment (MT)
B	13		33.9F	33.34	
A	13		31.01	30.58	
9	13		28.07	27.81	
8	13		25.12	25.04	
7	13		22.27	22.27	
Total 40'S/45'S Abv. Dk.	65				

Tier No.	No. Cont.	Tier Wgt. M. Tons	VCG (M) 40'	V. Moment (MT)
5	6		16.34	
4	4		13.69	
3	2		11.09	
2	2		8.35	
Total 40'S Blw. Dk.	14			

ROW 2 CONTAINER STOWAGE 40'/45' CONTAINERS

PORT												STBD
02BP	02B8	02B6	02B4	02B2	02B0	02BC	02B1	02B3	02B5	02B7	02B9	02BS
02AP	02A8	02A6	02A4	02A2	02A0	02AC	02A1	02A3	02A5	02A7	02A9	02AS
029P	0298	0296	0294	0292	0290	029C	0291	0293	0295	0297	0299	029S
028P	0288	0286	0284	0282	0280	028C	0281	0283	0285	0287	0289	028S
027P	0278	0276	0274	0272	0270	027C	0271	0273	0275	0277	0279	027S

0258	0256	0254	0252	0250	0251	0253	0255	0257	0259
	0246	0244	0242	0240	0241	0243	0245	0247	
		0234	0232	0230	0231	0233	0235		
			0222	0220	0221	0223			
				0210	0211				

Tier No.	No. Cont.	Tier Wgt. M. Tons	VCG (M) 40'	VCG (M) 45'	V. Moment (MT)
B	13/11		33.34	34.11	
A	13/11		30.58	31.17	
9	13/11		27.81	28.23	
8	13/11		25.04	25.29	
7	13/11		22.27	22.35	
Total 40'S/45'S Abv. Dk.	65/55				

Tier No.	No. Cont.	Tier Wgt. M. Tons	VCG (M) 40'	V. Moment (MT)
5	10		16.44	
4	8		13.77	
3	6		11.10	
2	4		8.43	
1	2		5.76	
Total 40'S Blw. Dk.	30			

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ROW 2 CONTAINER STOWAGE 20' CONTAINERS

PORT	STBD
02BP	02BS
02AP	02AS
029P	029S
028P	028S
027P	027S

Tier No.	No. Cont.	Tier Wgt. M. Tons	VCG (M) 20'	V. Moment (MT)
B	2		32.65	
A	2		30.04	
9	2		27.43	
8	2		24.81	
7	2		22.20	
Total 20'S Abv. Dk.	10			

ROW 3 CONTAINER STOWAGE 20' CONTAINERS

PORT	STBD
03BP	03BS
03AP	03AS
039P	039S
038P	038S
037P	037S

Tier No.	No. Cont.	Tier Wgt. M. Tons	VCG (M) 20'	V. Moment (MT)
B	2		32.65	
A	2		30.04	
9	2		27.43	
8	2		24.81	
7	2		22.20	
Total 20'S Abv. Dk.	10			

ROW 4 CONTAINER STOWAGE 40'/45' CONTAINERS

PORT / STBD

04BP	04B8	04B6	04B4	04B2	04B0	04BC	04B1	04B3	04B5	04B7	04B9	04BS
04AP	04A8	04A6	04A4	04A2	04A0	04AC	04A1	04A3	04A5	04A7	04A9	04AS
049P	0498	0496	0494	0492	0490	049C	0491	0493	0495	0497	0499	049S
048P	0488	0486	0484	0482	0480	048C	0481	0483	0485	0487	0489	048S
047P	0478	0476	0474	0472	0470	047C	0471	0473	0475	0477	0479	047S

0458	0456	0454	0452	0450	0451	0453	0455	0457	0459
0448	0446	0444	0442	0440	0441	0443	0445	0447	0449
	0436	0434	0432	0430	0431	0433	0435	0437	
		0424	0422	0420	0421	0423	0425		
			0412	0410	0411	0413			
				0400	0401				

Tier No.	No. Cont.	Tier Wgt. M. Tons	VCG (M) 40'/45'	VCG (M) 40'	V. Moment (MT)
B	13		33.95	33.34	
A	13		31.01	30.58	
9	13		28.07	27.81	
8	13		25.12	25.04	
7	13		22.27	22.27	
Total 40'S/45'S Abv. Dk.	65				

Tier No.	No. Cont.	Tier Wgt. M. Tons	40'	V. Moment (MT)
5	10		16.59	
4	10		13.84	
3	8		11.17	
2	6		8.50	
1	4		5.83	
0	2		3.15	
Total 40'S Blw. Dk.	40			

ROW 5 CONTAINER STOWAGE 40'/45' CONTAINERS

PORT / STBD

05BP	05B8	05B6	05B4	05B2	05B0	05BC	05B1	05B3	05B5	05B7	05B9	05BS
05AP	05A8	05A6	05A4	05A2	05A0	05AC	05A1	05A3	05A5	05A7	05A9	05AS
059P	0598	0596	0594	0592	0590	059C	0591	0593	0595	0597	0599	059S
058P	0588	0586	0584	0582	0580	058C	0581	0583	0585	0587	0589	058S
057P	0578	0576	0574	0572	0570	057C	0571	0573	0575	0577	0579	057S

Tier No.	No. Cont.	Tier Wgt. M. Tons	VCG (M) 40'	VCG (M) 45'	V. Moment (MT)
B	13/11		33.34	34.11	
A	13/11		30.58	31.17	
9	13/11		27.81	28.23	
8	13/11		25.04	25.29	
7	13/11		22.27	23.35	
Total 40'S/45'S Abv. Dk.	65/55				

ROW 5 CONTAINER STOWAGE 20' CONTAINERS

PORT	STBD
05BP	05BS
05AP	05AS
059P	059S
058P	058S
057P	057S

0568	0566	0564	0562	0560	0561	0563	0565	0567	0569
0558	0556	0554	0552	0550	0551	0553	0555	0557	0559
0548	0546	0544	0542	0540	0541	0543	0545	0547	0549
0538	0536	0534	0532	0530	0531	0533	0535	0537	0539
0528	0526	0524	0522	0520	0521	0523	0525	0527	0529
		0514	0512	0510	0511	0513	0515		
			0502	0500	0501	0503			

Tier No.	No. Cont.	Tier Wgt. M. Tons	VCG (M) 20'	V. Moment (MT)
B	2		32.65	
A	2		30.04	
9	2		27.43	
8	2		24.81	
7	2		22.20	
Total 20'S Abv. Dk.	10			

Tier No.	No. Cont.	Tier Wgt. M. Tons	20'	V. Moment (MT)
6	10		18.63	
5	10		16.04	
4	10		13.45	
3	10		10.85	
2	10		8.26	
1	6		5.67	
0	4		3.08	
Total 20'S Blw. Dk.	60			

ROW 7 CONTAINER STOWAGE 40'/45' CONTAINERS

PORT — STBD

07BP	07B8	07B6	07B4	07B2	07B0	07BC	07B1	07B3	07B5	07B7	07B9	07BS
07AP	07A8	07A6	07A4	07A2	07A0	07AC	07A1	07A3	07A5	07A7	07A9	07AS
079P	0798	0796	0794	0792	0790	079C	0791	0793	0795	0797	0799	079S
078P	0788	0786	0784	0782	0780	078C	0781	0783	0785	0787	0789	078S
077P	0778	0776	0774	0772	0770	077C	0771	0773	0775	0777	0779	077S

0758	0756	0754	0752	0750	0751	0753	0755	0757	0759
0748	0746	0744	0742	0740	0741	0743	0745	0747	0749
0738	0736	0734	0732	0730	0731	0733	0735	0737	0739
0728	0726	0724	0722	0720	0721	0723	0725	0727	0729
	0716	0714	0712	0710	0711	0713	0715	0717	
		0704	0702	0700	0701	0703	0705		

Tier No.	No. Cont.	Tier Wgt. M. Tons	VCG (M) 40'/45'	VCG (M) 40'	V. Moment (MT)
B	13		33.95	33.34	
A	13		31.01	30.58	
9	13		28.07	27.81	
8	13		25.12	25.04	
7	13		22.27	22.27	
Total 40'S/45'S Abv. Dk.	65				

Tier No.	No. Cont.	Tier Wgt. M. Tons	VCG (M) 40'	V. Moment (MT)
5	10		16.87	
4	10		14.13	
3	10		11.38	
2	10		8.64	
1	8		5.90	
0	6		3.15	
Total 40'S Blw. Dk.	54			

ROW 6 CONTAINER STOWAGE 20' CONTAINERS

PORT	STBD
06BP	06BS
06AP	06AS
069P	069S
068P	068S
067P	067S

0668	0666	0664	0662	0660	0661	0663	0665	0667	0669
0658	0656	0654	0652	0650	0651	0653	0655	0657	0659
0648	0648	0644	0642	0640	0641	0643	0645	0647	0649
0638	0636	0634	0632	0630	0631	0633	0635	0637	0639
0628	0626	0624	0622	0620	0621	0623	0625	0627	0629
		0614	0612	0610	0611	0613	0615		
			0602	0600	0601	0603			

Tier No.	No. Cont.	Tier Wgt. M. Tons	VCG (M) 20'	V. Moment (MT)
B	2		32.65	
A	2		30.04	
9	2		27.43	
8	2		24.81	
7	2		22.20	
Total 20'S Abv. Dk.	10			

Tier No.	No. Cont.	Tier Wgt. M. Tons	VCG (M) 20'	V. Moment (MT)
6	10		18.63	
5	10		16.04	
4	10		13.45	
3	10		10.85	
2	10		8.26	
1	6		5.67	
0	4		3.08	
Total 20'S Blw. Dk.	60			

ROW 9 CONTAINER STOWAGE 40'/45' CONTAINERS

PORT — STBD

09BP	09B8	09B6	09B4	09B2	09B0	09BC	09B1	09B3	09B5	09B7	09B9	09BS
09AP	09A8	09A6	09A4	09A2	09A0	09AC	09A1	09A3	09A5	09A7	09A9	09AS
099P	0998	0996	0994	0992	0990	099C	0991	0993	0995	0997	0999	099S
098P	0988	0986	0984	0982	0980	098C	0981	0983	0985	0987	0989	098S
097P	0978	0976	0974	0972	0970	097C	0971	0973	0975	0977	0979	097S

0958	0956	0954	0952	0950	0951	0953	0955	0957	0959
0948	0946	0944	0942	0940	0941	0943	0945	0947	0949
0938	0936	0934	0932	0930	0931	0933	0935	0937	0939
0928	0926	0924	0922	0920	0921	0923	0925	0927	0929
0918	0916	0914	0912	0910	0911	0913	0915	0917	0919
0908	0906	0904	0902	0900	0901	0903	0905	0907	0909

Tier No.	No. Cont.	Tier Wgt. M. Tons	VCG (M) 40'/45'	VCG (M) 40'	V. Moment (MT)
B	13		33.95	33.34	
A	13		31.01	30.58	
9	13		28.07	27.81	
8	13		25.12	25.04	
7	13		22.27	22.27	
Total 40'S/45'S Abv. Dk.	65				

Tier No.	No. Cont.	Tier Wgt. M. Tons	VCG (M) 40'	V. Moment (MT)
5	10		16.87	
4	10		14.12	
3	10		11.38	
2	10		8.64	
1	10		5.90	
0	10		3.15	
Total 40'S Blw. Dk.	60			

ROW 8 CONTAINER STOWAGE 40'/45' CONTAINERS

PORT — STBD

08BP	08B8	08B6	08B4	08B2	08B0	08BC	08B1	08B3	08B5	08B7	08B9	08BS
08AP	08A8	08A6	08A4	08A2	08A0	08AC	08A1	08A3	08A5	08A7	08A9	08AS
089P	0898	0896	0894	0892	0890	089C	0891	0893	0895	0897	0899	089S
088P	0888	0886	0884	0882	0880	088C	0881	0883	0885	0887	0889	088S
087P	0878	0876	0874	0872	0870	087C	0871	0873	0875	0877	0879	087S

0858	0856	0854	0852	0850	0851	0853	0855	0857
0848	0846	0844	0842	0840	0841	0843	0845	0847
0838	0836	0834	0832	0830	0831	0833	0835	0837
0828	0826	0824	0822	0820	0821	0823	0825	0827
0818	0816	0814	0812	0810	0811	0813	0815	0817
	0806	0804	0802	0800	0801	0803	0805	

Tier No.	No. Cont.	Tier Wgt. M. Tons	VCG (M) 40'	VCG (M) 45'	V. Moment (MT)
B	13		33.34	34.11	
A	13		30.58	31.17	
9	13		27.81	28.23	
8	13		25.04	25.29	
7	13		22.27	22.35	
Total 40'S/45'S Abv. Dk.	65				

Tier No.	No. Cont.	Tier Wgt. M. Tons	VCG (M) 45'	V. Moment (MT)
5	10		17.77	
4	10		14.85	
3	10		11.93	
2	10		9.01	
1	10		6.09	
0	8		3.23	
Total 45'S Blw. Dk.	58			

ROW 11 CONTAINER STOWAGE 40'/45' CONTAINERS

PORT												STBD
11BP	11B8	11B6	11B4	11B2	11B0	11BC	11B1	11B3	11B5	11B7	11B9	11BS
11AP	11A8	11A6	11A4	11A2	11A0	11AC	11A1	11A3	11A5	11A7	11A9	11AS
119P	1198	1196	1194	1192	1190	119C	1191	1193	1195	1197	1199	119S
118P	1188	1186	1184	1182	1180	118C	1181	1183	1185	1187	1189	118S
117P	1178	1176	1174	1172	1170	117C	1171	1173	1175	1177	1179	117S

Tier No.	No. Cont.	Tier Wgt. M. Tons	VCG (M) 40'/45'	VCG (M) 40'	V. Moment (MT)
B	13		33.95	33.34	
A	13		31.01	30.58	
9	13		28.07	27.81	
8	13		25.12	25.04	
7	13		22.27	22.27	
Total 40'S/45'S Abv. Dk.	65				

1158	1156	1154	1152	1150	1151	1153	1155	1157	1159
1148	1146	1144	1142	1140	1141	1143	1145	1147	1149
1138	1136	1134	1132	1130	1131	1133	1135	1137	1139
1128	1126	1124	1122	1120	1121	1123	1125	1127	1129
1118	1116	1114	1112	1110	1111	1113	1115	1117	1119
1108	1106	1104	1102	1100	1101	1103	1105	1107	1109

Tier No.	No. Cont.	Tier Wgt. M. Tons	VCG (M) 40'	V. Moment (MT)
5	10		16.87	
4	10		14.12	
3	10		11.38	
2	10		8.64	
1	10		5.90	
0	10		3.15	
Total 40'S Blw. Dk.	60			

ROW 13 CONTAINER STOWAGE 20' CONTAINERS

PORT											STBD
13AP	13A8	13A6	13A4	13A2	13A0	13A1	13A3	13A5	13A7	13A9	13AS
139P	1398	1396	1394	1392	1390	1391	1393	1395	1397	1399	139S
138P	1388	1386	1384	1382	1380	1381	1383	1385	1387	1389	138S
	1378	1376	1374	1372	1370	1371	1373	1375	1377	1379	

Tier No.	No. Cont.	Tier Wgt. M. Tons	VCG (M) 20'	V. Moment (MT)
A	12		28.03	
9	12		25.44	
8	12		22.85	
7	10		20.26	
Total 20'S Row #13	46			

ROW 14 CONTAINER STOWAGE 40' CONTAINERS

PORT											STBD
149P	1498	1496	1494	1492	1490	1491	1493	1495	1497	1499	149S
148P	1488	1486	1484	1482	1480	1481	1483	1485	1487	1489	148S
	1478	1476	1474	1472	1470	1471	1473	1475	1477	1479	

Tier No.	No. Cont.	Tier Wgt. M. Tons	VCG (M) 40'	V. Moment (MT)
9	12		25.85	
8	12		23.11	
7	10		20.36	
Total 40'S Row #14	34			

ROW 10 CONTAINER STOWAGE 40'/45' CONTAINERS

PORT												STBD
10BP	10B8	10B6	10B4	10B2	10B0	10BC	10B1	10B3	10B5	10B7	10B9	10BS
10AP	10A8	10A6	10A4	10A2	10A0	10AC	10A1	10A3	10A5	10A7	10A9	10AS
109P	1098	1096	1094	1092	1090	109C	1091	1093	1095	1097	1099	109S
108P	1088	1086	1084	1082	1080	108C	1081	1083	1085	1087	1089	108S
107P	1078	1076	1074	1072	1070	107C	1071	1073	1075	1077	1079	107S

Tier No.	No. Cont.	Tier Wgt. M. Tons	VCG (M) 40'	VCG (M) 45'	V. Moment (MT)
B	13		33.34	34.11	
A	13		30.58	31.17	
9	13		27.81	28.23	
8	13		25.04	25.29	
7	13		22.27	22.35	
Total 40'S/45'S Abv. Dk.	65				

1058	1056	1054	1052	1050	1051	1053	1055	1057	1059
1048	1046	1044	1042	1040	1041	1043	1045	1047	1049
1038	1036	1034	1032	1030	1031	1033	1035	1037	1039
1028	1026	1024	1022	1020	1021	1023	1025	1027	1029
1018	1016	1014	1012	1010	1011	1013	1015	1017	1019
1008	1006	1004	1002	1000	1001	1003	1005	1007	1009

Tier No.	No. Cont.	Tier Wgt. M. Tons	VCG (M) 45'	V. Moment (MT)
5	10		17.77	
4	10		14.85	
3	10		11.93	
2	10		9.01	
1	10		6.09	
0	10		3.23	
Total 45' Blw. Dk.	60			

ROW 12 CONTAINER STOWAGE 40'/45' CONTAINERS

PORT												STBD
12BP	12B8	12B6	12B4	12B2	12B0	12BC	12B1	12B3	12B5	12B7	12B9	12BS
12AP	12A8	12A6	12A4	12A2	12A0	12AC	12A1	12A3	12A5	12A7	12A9	12AS
129P	1298	1296	1294	1292	1290	129C	1291	1293	1295	1297	1299	129S
128P	1288	1286	1284	1282	1280	128C	1281	1283	1285	1287	1289	128S
127P	1278	1276	1274	1272	1270	127C	1271	1273	1275	1277	1279	127S

Tier No.	No. Cont.	Tier Wgt. M. Tons	VCG (M) 40'/45'	VCG (M) 40'	V. Moment (MT)
B	13		33.95	33.34	
A	13		31.01	30.58	
9	13		28.07	27.81	
8	13		25.12	25.04	
7	13		22.27	22.27	
Total 40'S/45'S Abv. Dk.	65				

1258	1256	1254	1252	1250	1251	1253	1255	1257	1259
1248	1246	1244	1242	1240	1241	1243	1245	1247	1249
1238	1236	1234	1232	1230	1231	1233	1235	1237	1239
1228	1226	1224	1222	1220	1221	1223	1225	1227	1229
1218	1216	1214	1212	1210	1211	1213	1215	1217	1219
	1206	1204	1202	1200	1201	1203	1205	1207	

Tier No.	No. Cont.	Tier Wgt. M. Tons	VCG (M) 40'	V. Moment (MT)
5	10		16.87	
4	10		14.12	
3	10		11.38	
2	10		8.64	
1	10		5.90	
0	8		3.15	
Total 40'S Blw. Dk.	58			

ROW 16 CONTAINER STOWAGE 40'/45' CONTAINERS

PORT												STBD
16BP	16B8	16B6	16B4	16B2	16B0	16BC	16B1	16B3	16B5	16B7	16B9	16BS
16AP	16A8	16A6	16A4	16A2	16A0	16AC	16A1	16A3	16A5	16A7	16A9	16AS
169P	1698	1696	1694	1692	1690	169C	1691	1693	1695	1697	1699	169S
168P	1688	1686	1684	1682	1680	168C	1681	1683	1685	1687	1689	168S
167P	1678	1676	1674	1672	1670	167C	1671	1673	1675	1677	1679	167S

1658	1656	1654	1652	1650	1651	1653	1655	1657	1659
	1646	1644	1642	1640	1641	1643	1645	1647	

Tier No.	No. Cont.	Tier Wgt. M. Tons	VCG (M) 40'/45'	VCG (M) 40'	V. Moment (MT)
B	10		33.85	33.34	
A	10		31.01	30.58	
9	10		28.07	27.81	
8	10		25.12	25.04	
7	10		22.27	22.27	
Total 40'S/45'S Abv. Dk.	65				

Tier No.	No. Cont.	Tier Wgt. M. Tons	VCG (M) 40'	V. Moment (MT)
5	10		16.34	
4	8		10.52	
Total 40' Blw. Dk.	18			

ROW 15 CONTAINER STOWAGE 40'/45' CONTAINERS

PORT												STBD
15BP	15B8	15B6	15B4	15B2	15B0	15BC	15B1	15B3	15B5	15B7	15B9	15BS
15AP	15A8	15A6	15A4	15A2	15A0	15AC	15A1	15A3	15A5	15A7	15A9	15AS
159P	1598	1596	1594	1592	1590	159C	1591	1593	1595	1597	1599	159S
158P	1588	1586	1584	1582	1580	158C	1581	1583	1585	1587	1589	158S
157P	1578	1576	1574	1572	1570	157C	1571	1573	1575	1577	1579	157S

1558	1556	1554	1552	1550	1551	1553	1555	1557	1559
1548	1546	1544	1542	1540	1541	1543	1545	1547	1549
	1536	1534	1532	1530	1531	1533	1535	1537	

Tier No.	No. Cont.	Tier Wgt. M. Tons	VCG (M) 40'/45'	VCG (M) 40'	V. Moment (MT)
B	13		33.95	33.34	
A	13		31.01	30.58	
9	13		28.07	27.81	
8	13		25.12	25.04	
7	13		22.27	22.27	
Total 40'S/45'S Abv. Dk.	65				

Tier No.	No. Cont.	Tier Wgt. M. Tons	VCG (M) 40'	V. Moment (MT)
5	10		16.39	
4	10		13.65	
3	8		10.93	
Total 40'S Blw. Dk.	28			

ROW 18 CONTAINER STOWAGE 20' CONTAINERS

PORT											STBD
189P	1898	1896	1894	1892	1890	1891	1893	1895	1897	1899	189S
188P	1888	1886	1884	1882	1880	1881	1883	1885	1887	1889	188S
187P	1878	1876	1874	1872	1870	1871	1873	1875	1877	1879	187S

Tier No.	No. Cont.	Tier Wgt. M. Tons	VCG (M) 20'	V. Moment (MT)
9	12		28.14	
8	12		25.54	
7	12		22.93	
Total 20' Row #18	36			

ROW 17 CONTAINER STOWAGE 40' CONTAINERS

PORT											STBD
178P	1788	1786	1784	1782	1780	1781	1783	1785	1787	1789	178S
177P	1778	1776	1774	1772	1770	1771	1773	1775	1777	1779	177S

Tier No.	No. Cont.	Tier Wgt. M. Tons	VCG (M) 40'	V. Moment (MT)
8	12		25.75	
7	12		23.01	
Total 40' Row #17	24			

ROW 17 CONTAINER STOWAGE 20' CONTAINERS

PORT											STBD
179P	1798	1796	1794	1792	1790	1791	1793	1795	1797	1799	179S
178P	1788	1786	1784	1782	1780	1781	1783	1785	1787	1789	178S
177P	1778	1776	1774	1772	1770	1771	1773	1775	1777	1779	177S

Tier No.	No. Cont.	Tier Wgt. M. Tons	VCG (M) 20'	V. Moment (MT)
9	12		28.14	
8	12		25.54	
7	12		22.93	
Total 20' Row #17	36			

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END

ROLL NO. 2